

From: Whittaker, Laura [laura.whittaker@aptim.com]

Sent: Wednesday, September 5, 2018 6:34 AM

To: Liscio, Matthew P CIV SEA 04, NAVSEA DET RASO [matthew.liscio@navy.mil]

CC: Howard, Leslie A CIV NAVFAC SW [leslie.howard@navy.mil]; Fowler, Janet CIV NAVSEA, SEA 04N [janet.fowler1@navy.mil]; Johnson, Nels [Nels.Johnson@aptim.com]; Schul, Raymond [raymond.schul@aptim.com]; Guillory, Jeffrey [jeffrey.guillory@aptim.com]; Amy Mangel [amy.mangel@aptim.com]; Hanelt, Norm [Norm.Hanelt@aptim.com]; Killpack, Randall [randall.killpack@aptim.com]; Chi, Minhsec [minhsec.chi@aptim.com]; Orman, Sean [sean.orman@aptim.com]; Rogers, Bryon [bryon.rogers@aptim.com]

Subject: [Non-DoD Source] Data package ready for review - HPNS PE-2, RSY D1 (DC)

Attachments: HPNS APTIM RSY D1 (DC) Soil Non-LLRW Concurrence Request 09052018 (reduced).pdf

Mr. Liscio,

APTIM request RASO concurrence to designate this soil as Non-LLRW soil.

If there are any questions or if additional data is required, please contact me.

Thank you.

LAURA WHITTAKER

Radiological Technician 4 (RCT IV)

APTIM | Radiation Safety

M 423 544 9145

E laura.whittaker@aptim.com



2410 Cherahala Blvd
Knoxville, TN 37932

APTIM.com



Hunters Point Naval Shipyard, Parcel E-2 RSY Data Report

Contract No. EMAC III CTO-0013		
RSY Pad: D1	RSY Pad Use Number: Deconstruction (DC)	First Submittal <input checked="" type="checkbox"/> Second Submittal <input type="checkbox"/>
Data attached and submitted by: Laura Whittaker		Data Report Submittal Date: 09/05/2018

Soil Sample Data					
Sample Identification	Survey Location	Type of Sample	²²⁶ Ra Final Analytical Results (pCi/g)	¹³⁷ Cs Final Analytical Results (pCi/g)	Total Sr Final Analytical Results (pCi/g)
Upper limit of site reference background			1.633	0.113	0.331
PE2-RSYD1-DC-S001	1	Systematic	0.594	0.0177	0.0509
PE2-RSYD1-DC-S002	2	Systematic	0.260	0.0209	N/A
PE2-RSYD1-DC-S003	3	Systematic	0.582	-0.0375	N/A
PE2-RSYD1-DC-S004	4	Systematic	0.523	-0.0275	N/A
PE2-RSYD1-DC-S005	5	Systematic	0.548	-0.0232	N/A
PE2-RSYD1-DC-S006	6	Systematic	0.667	-0.0196	N/A
PE2-RSYD1-DC-S007	7	Systematic	0.616	0.0166	N/A
PE2-RSYD1-DC-S008	8	Systematic	0.499	-0.00719	N/A
PE2-RSYD1-DC-S009	9	Systematic	0.175	-0.0575	N/A
PE2-RSYD1-DC-S010	10	Systematic	0.544	-0.00303	N/A
PE2-RSYD1-DC-S011	11	Systematic	0.606	-0.0175	0.0170
PE2-RSYD1-DC-S012	12	Systematic	0.579	-0.00653	N/A
PE2-RSYD1-DC-S013	13	Systematic	0.577	-0.0244	N/A
PE2-RSYD1-DC-S014	14	Systematic	0.417	0.00993	N/A
PE2-RSYD1-DC-S015	15	Systematic	0.620	-0.0266	N/A
PE2-RSYD1-DC-S016	16	Systematic	0.626	0.0356	N/A
PE2-RSYD1-DC-S017	17	Systematic	0.562	0.0113	N/A
PE2-RSYD1-DC-S018	18	Systematic	0.247	0.0258	N/A

²²⁶Ra Radium-226
¹³⁷Cs Cesium-137
 Sr Strontium
 pCi/g Picocuries per gram

Instrument and Survey Data										
Activity	Survey #	Date	Meter	Calibration Due Date	Serial #	Reference Area Static Bkgd	Reference Area Static 3σ IL	Reference Area Scan Bkgd	Reference Area Scan 3σ IL	Range
RSI Gamma Walkover Survey	HPRS-07242018-PE2-ROV2-2821	07/24/2018	RS-701/ RSX-1	N/A	Console: 7236 Detectors: 5447,5448	N/A	N/A	3,400 CPS	4,872 CPS	2,869-4,021 CPS
RSI Follow-up Static Survey	HPRS-07302018-PE2-JSS2-2850	07/30/2018	RS-701/ RSX-1	N/A	Console: 7236 Detectors: 5447,5448	3,612 CPS	4,255 CPS	N/A	N/A	3,039-4,149 CPS
Systematic Sample Survey	HPRS-07242018-PE2-JSS-2825	07/24/2018	2221	06/29/2019	117634	15,069 CPM	17,241 CPM	N/A	N/A	13,078-15,176 CPM

3σ IL Investigation Level (established at 3σ above the mean of the Reference Area dataset)
 CPS Counts per second
 CPM Counts per minute

Summary
<p>1) RSI gamma walkover survey and data review—upon review of initial scan data, follow-up static investigations were deemed necessary, and investigation locations were identified as per the RSI Data Evaluation Process (pages 3-4). Gamma scan coverage is shown on the Systematic Sample Survey map (page 8). Contour maps of scan data are shown on RSI Data Plots (page 5). Data review results are summarized on RSI Review Summary (page 6).</p>
<p>2) RSI Follow-up static survey—48 locations identified during the data review process were investigated, with readings less than the Reference Area static IL at all locations for regions of interest (ROIs) 3, 6, 7, 8, and 10 (VD1). Follow-up locations are shown on the RSI Follow-up Static Survey map (page 7).</p>
<p>3) Eighteen systematic soil samples (001-018) were obtained and submitted for gamma spectroscopy analysis. Sample locations for systematic samples are shown on the Systematic Sample Survey map (page 8). TestAmerica sample results are attached (pages 59-82).</p> <p>Ten percent of the systematic soil samples (two samples in total, PE2-RSYD1-DC-S001 & PE2-RSYD1-DC-S011) were also analyzed for total strontium. Total Strontium results are also included in the TestAmerica sample results report (pages 59-82).</p>
<p>Conclusions:</p> <p>All locations with elevated Z-scores identified by the RSI gamma walkover survey were determined to be consistent with background. 48 locations were investigated during the follow-up static survey, with readings less than the Reference Area static IL at all locations for ROIs 3, 6, 7, 8, and 10 (VD1). Spectral analysis results and gamma static data for each region of interest (ROI) are provided (pages 9-56).</p> <p>Final analytical results for systematic samples from this RSY pad are concluded to be comparable to background. Histograms showing soil sample activity concentrations are provided (pages 57-58). Ten percent of the systematic soil samples (two samples in total, PE2-RSYD1-DC-S001 & PE2-RSYD1-DC-S011) were also analyzed for total strontium, with concentrations less than the Project Action Limit of 0.331 pCi/g, as shown in the Soil Sample Data table (page 1).</p> <p>This data package characterizes the construction base layer for RSY D1 pad. The soil was initially import clean material.</p> <p>APTIM request RASO concurrence to release this soil as Non-LLRW.</p> <p>Disposition: This soil shall be dispositioned as non-LLRW waste. The soil will be stockpiled onsite for reuse following appropriate chemical characterization.</p>

RSI Data Evaluation Process

RS-700 Mobile Radiation Monitoring System

- Self-contained gamma-ray radiation detection and monitoring system
- (2) RSX-1 4-liter NaI(Tl) gamma detectors oriented perpendicular to the direction of travel (VD1 denotes both detectors summed; VD3 refers to the left detector; and VD4 refers to the right detector)
- Multi-Channel Analyzer, allowing for monitoring of energy-specific regions of interest (ROIs)
- RadAssist survey software for control, monitoring, and recording

Ten ROIs have been established for radium and progeny, cesium, and cobalt, as well as other naturally-occurring or anthropogenic gamma-emitting radionuclides that may be of interest:

ROI	Description	Energy Range (keV)	Primary Peak (keV)
1	Total counts	411 – 2811	N/A
2	Potassium	1371 – 1569	1460
3	U/Ra-226	1659 – 1860	1764 (Bi-214)
4	Thorium	2409 – 2811	2614 (Tl-208)
5	Annihilation	456 – 570	511
6	Ra-226	546 – 666	609 (Bi-214)
7	Cs-137	600 - 720	662
8	Pb-214/Ra-226	327 – 399	351
9	Co-60	1085 - 1370	1173/1332
10	Gross Counts	24 – 2811	N/A

A tiered approach is used during data review to identify follow-up locations. Raw data are exported to a comma delimited format using RadAssist and imported into an Excel spreadsheet for review and analysis. The following review steps are completed to determine if additional follow-up measurements are necessary:

- **Playback Review:** The data file is replayed in RadAssist and reviewed for elevated count rates in ROIs 6, 7, 9, and 10 for virtual detector (VD) 1 (both detectors summed). The scan screen is also monitored for elevated count rates and alarms.
- **Count Rate Time Series Review:** The count rates for ROIs 6, 7, 9, and 10 for VDs 1, 3 (detector 1), and 4 (detector 2) are plotted in a time series and reviewed for additional peaks in count rate.
- **All ROIs:**
 - **Z-Scores:** The Z-Scores are calculated for each location in all ROIs for VDs 1, 3, and 4. Any location with four or more ROIs having a Z-Score greater than three ($Z > 3$) is marked for follow-up.
 - **Local Z-Scores:** Local Z-Scores are calculated using a moving average for each data point in all ROIs for VDs 1, 3, and 4 to identify elevated count rates where the background is variable (e.g. multiple surface types). Any location (in a survey unit that meets this condition) with four or more ROIs having a local $Z > 3$ is marked for follow-up.
 - **Semi-local Z-Scores:** Semi- local Z-Scores are calculated using the global average, but with a moving average for the standard deviation for VDs 1, 3, and 4. This is used for survey data that have a consistent background but an area or areas of highly elevated count rates, in order to identify smaller areas of elevated count rates that may not otherwise be identified by the initial Z-score review. Any location (in a survey unit that meets this condition) with four or more ROIs having a semi-local $Z > 3$ is marked for follow-up.
- **ROIs 3, 6, 8, and 10 (radium-specific ROIs):**
 - Z-Scores: The Z-Scores are calculated for each location in the radium-specific ROIs for VDs 1, 3, and 4. Any location with three or more radium-specific ROIs having a $Z > 3$ is marked for follow-up.
 - Local Z-Scores: Local Z-Scores are calculated using a moving average for each data point in the radium-specific ROIs for VDs 1, 3, and 4 to identify elevated count rates where the background is variable (e.g. multiple surface types). Any location (in a survey unit that meets this condition) with three or more radium-specific ROIs having a local $Z > 3$ is marked for follow-up.
 - Semi-local Z-Scores: Semi- local Z-Scores are calculated using the global average, but with a moving average for the standard deviation for VDs 1, 3, and 4. This is used for survey data that have a consistent background but an area or areas of highly elevated count rates, in order to identify smaller areas of elevated count rates that may not otherwise

be identified by the initial Z-score review. Any location (in a survey unit that meets this condition) with three or more radium-specific ROIs having a semi-local $Z > 3$ is marked for follow-up.

- **ROI 7 (cesium-specific ROI):**
 - Z-Scores: Z-Scores are calculated for each location in ROI 7 for VDs 1, 3, and 4. Any location having a $Z > 3$ is marked for follow-up.
 - Local Z-Scores: Local Z-Scores are calculated using a moving average for each data point in ROI 7 for VDs 1, 3, and 4 to identify elevated count rates where the background is variable (e.g. multiple surface types). Any location (in a survey unit that meets this condition) having a local $Z > 3$ is marked for follow-up.
 - Semi-local Z-Scores: Semi- local Z-Scores are calculated using the global average, but with a moving average for the standard deviation in ROI 7 for VDs 1, 3, and 4. This is used for survey data that have a consistent background but an area or areas of highly elevated count rates, in order to identify smaller areas of elevated count rates that may not otherwise be identified by the initial Z-score review. Any location (in a survey unit that meets this condition) having a semi-local $Z > 3$ is marked for follow-up.
- **ROI 9 (cobalt-specific ROI):**
 - Z-Scores: Z-Scores are calculated for each location in ROI 9 for VDs 1, 3, and 4. Any location having a $Z > 3$ is marked for follow-up.
 - Local Z-Scores: Local Z-Scores are calculated using a moving average for each data point in ROI 9 for VDs 1, 3, and 4 to identify elevated count rates where the background is variable (e.g. multiple surface types). Any location (in a survey unit that meets this condition) having a local $Z > 3$ is marked for follow-up.
 - Semi-local Z-Scores: Semi- local Z-Scores are calculated using the global average, but with a moving average for the standard deviation in ROI 9 for VDs 1, 3, and 4. This is used for survey data that have a consistent background but an area or areas of highly elevated count rates, in order to identify smaller areas of elevated count rates that may not otherwise be identified by the initial Z-score review. Any location (in a survey unit that meets this condition) having a semi-local $Z > 3$ is marked for follow-up.
- **Z-Score Time Series Review:** The three types of Z-Scores for ROIs 6, 7, 9, and 10 for VDs 1, 3, and 4 are plotted in a time series and reviewed for additional peaks in Z-Scores.

Any location selected for follow-up or with a Z-Score > 3 in a radium-, cesium-, or cobalt-specific ROI will undergo spectral analysis to determine if it is statistically likely that there are ROC concentrations present at that location in quantities greater than background.

A background spectrum is subtracted from the local spectral data for a given location, and the resulting net spectrum is plotted. Critical levels, as defined in Section 6.7.1 of the Multi Agency Radiation Survey and Site Investigation Manual are calculated and plotted based on background levels. The critical level is the level, in counts, at which there is a statistical probability (with a predetermined confidence) of incorrectly identifying a measurement system background value as greater than background. Any response above this level is considered to be greater than background. The critical level is calculated for ROIs 6, 7, 8, and 9 according to the equation shown below:

Where:

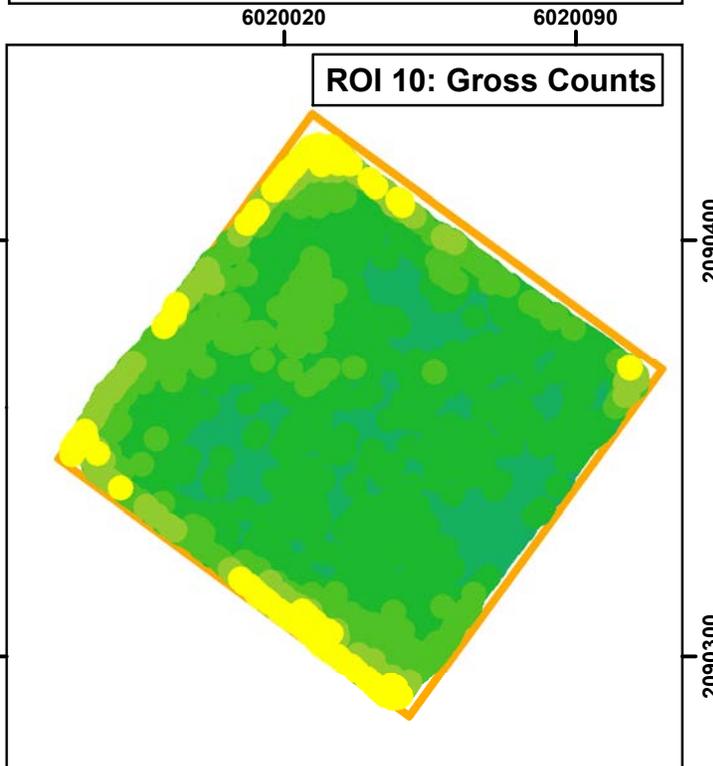
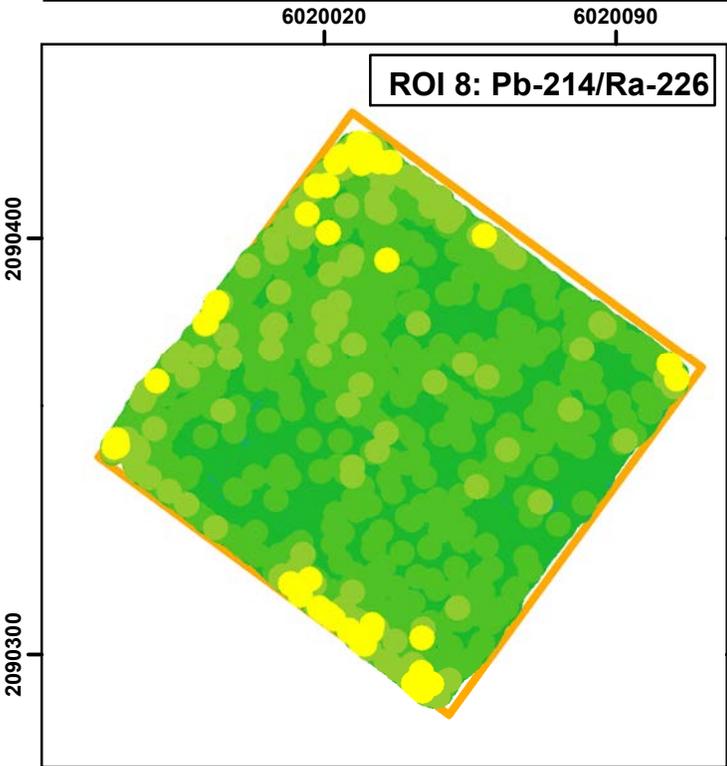
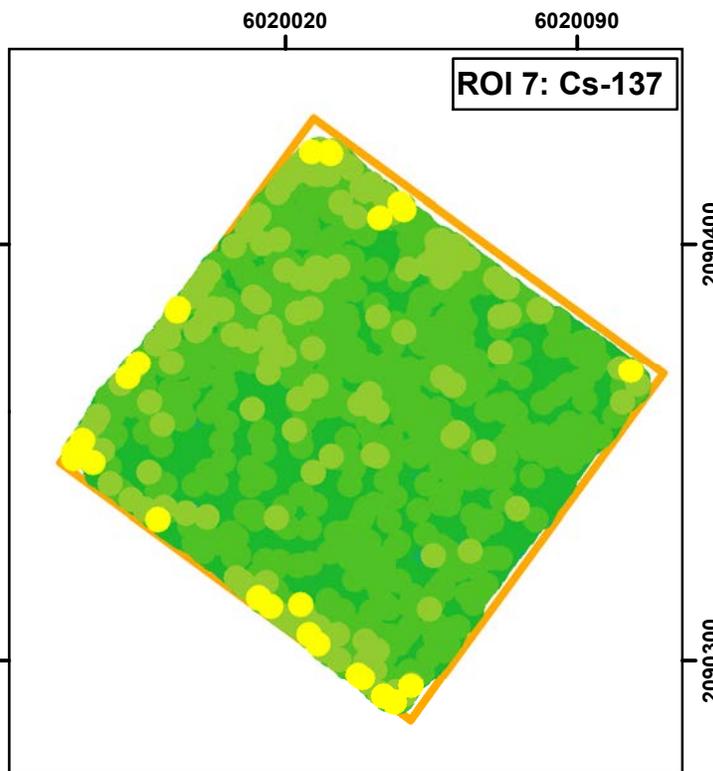
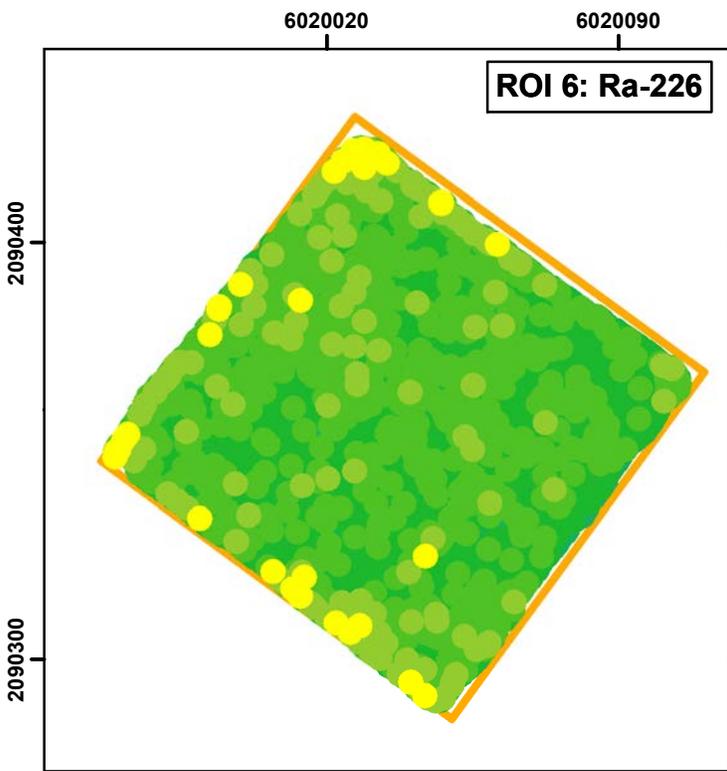
$$L_C = 2.33\sqrt{B}$$

LC = critical level (counts)
 B = average background in the ROI

When count rates in the net gamma spectrum at a given location do not exceed critical levels for any radium-, cesium-, or cobalt-specific energy ranges, it is unlikely that ROC concentrations exist at that location above background.

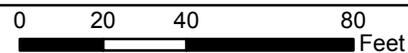
Any data point that is both above the critical level and within the energy range of a given ROI is considered above background for that radionuclide and will be flagged for further investigation in the field.

Contour Map



RS 700 Gamma Walkover Survey Data (VD1)

- > 3 std dev
- > 2 to < 3 std dev
- > 1 to < 2 std dev
- > 0 to < 1 std dev
- > -1 to < 0 std dev
- > -2 to < -1 std dev
- > -3 to < -2 std dev
- < -3 std dev
- RSY Pad Boundaries



Coordinate system: CSP Zone III, NAD83, US Survey Foot



RSI Review Summary

Summary:

48 locations were initially selected for follow-up investigation. Locations were identified by elevated peaks noted in the playback review and/or time series charts, and by using the Z-Score, Local Z-Score, and Semi-Local Z-Score reviews as described in the RSI Data Evaluation Process on pages 3-4. Spectral analyses performed on gamma static data at these locations do not indicate the presence of ^{226}Ra or ^{137}Cs above background. Gamma static readings at these locations are less than the Reference Area static IL for ROIs 3, 6, 7, 8, and 10; figures are provided on pages 9-56.

HPNS Parcel E-2 RSY Pad D1 Deconstruction

RSI Follow-up Static Survey
HPRS-03192018-PE2-JSS2-1939

In Situ GWS

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6020020

6020090

2090500

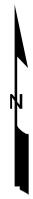
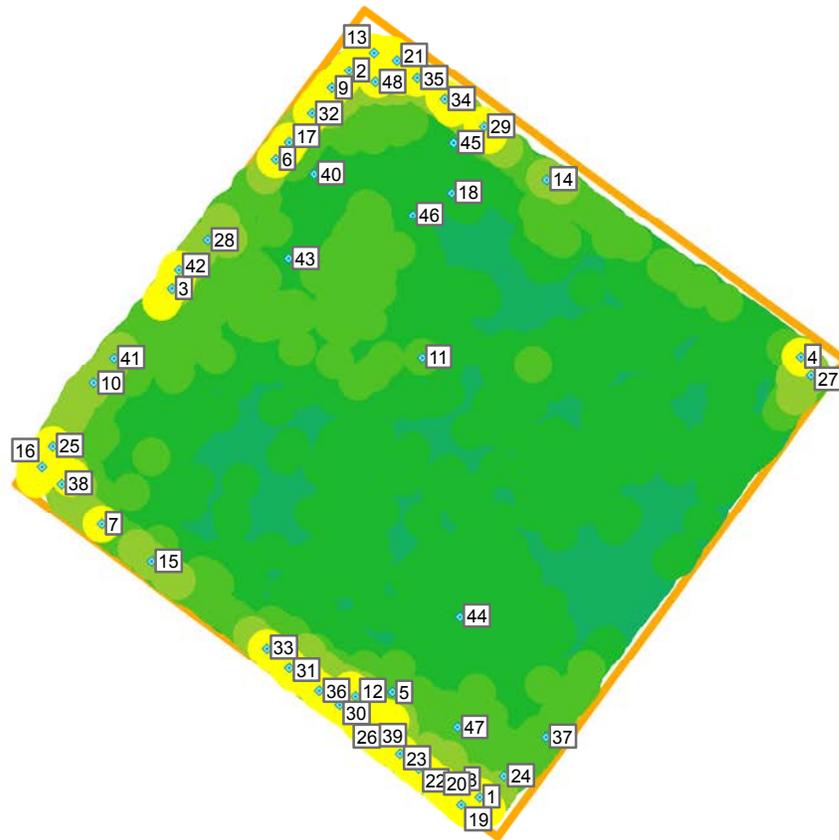
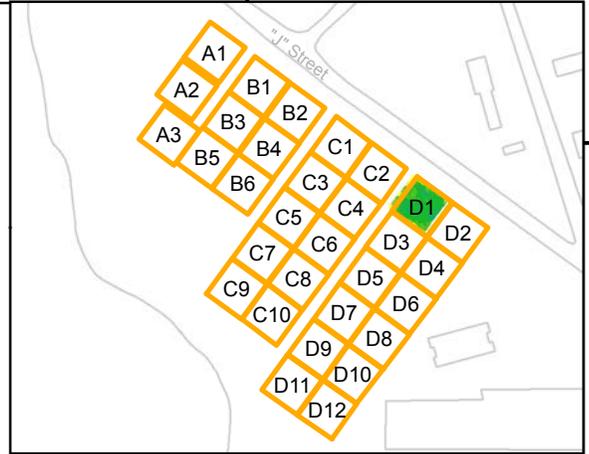
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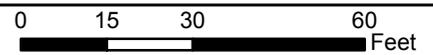
2090300

2090300



RS 700 Gamma Walkover Survey Data (VD1, ROI 10)

- ◆ Follow-up Locations
- > 3 std dev
- > 2 to < 3 std dev
- > 1 to < 2 std dev
- > 0 to < 1 std dev
- > -1 to < 0 std dev
- > -2 to < -1 std dev
- > -3 to < -2 std dev
- < -3 std dev
- RSY Pad Boundaries



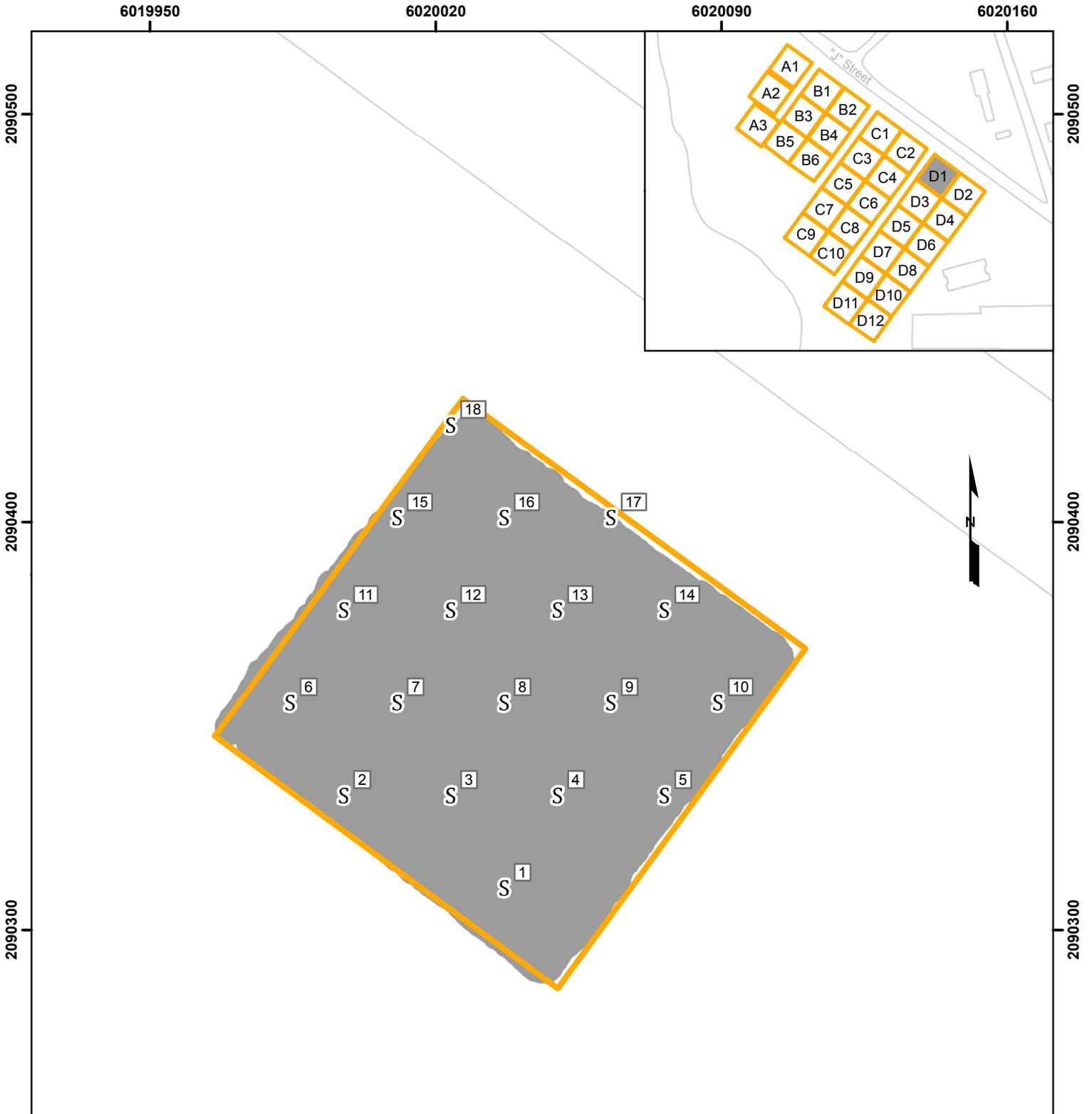
Coordinate system: CSP Zone III. NAD83, US Survey Foot



HPNS Parcel E-2
RSY Pad D1
Deconstruction

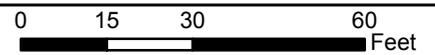
Systematic Sample Survey
HPRS-07242018-PE2-JSS-2825

In Situ GWS



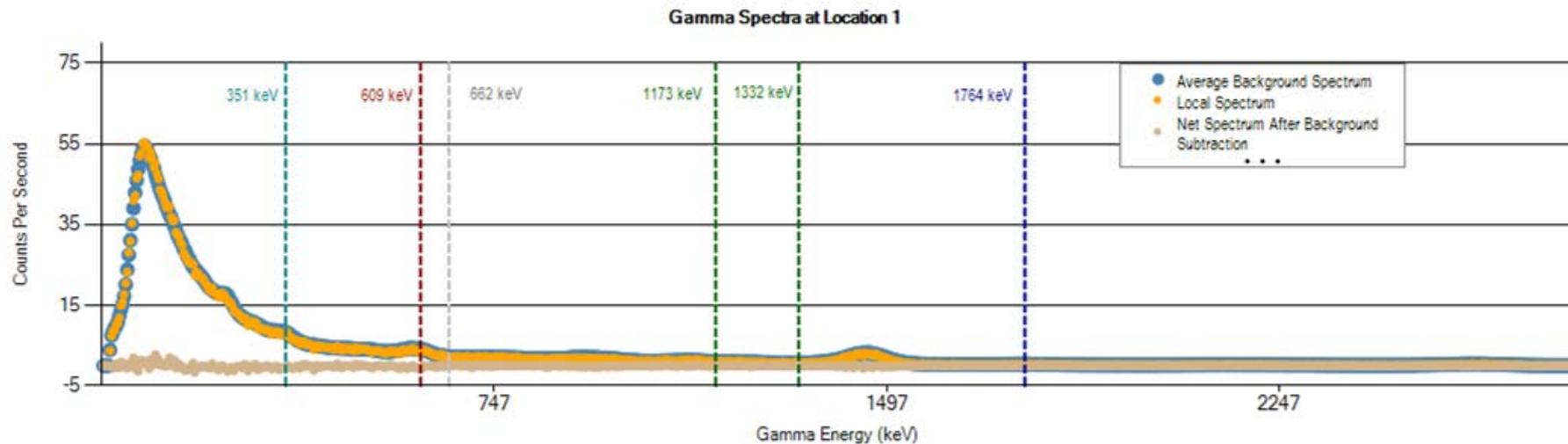
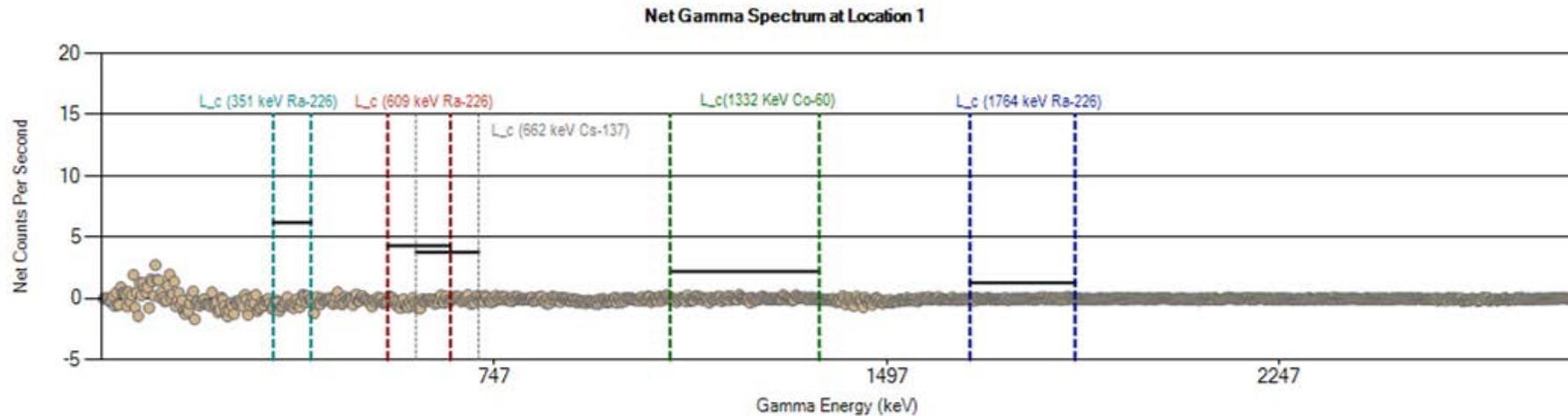
Survey Instrument: Model 2221/ 44-20
Serial Number: 117634

- Systematic Sample Locations
- RS-700 GWS Scan Coverage
- RSY Pad Boundaries

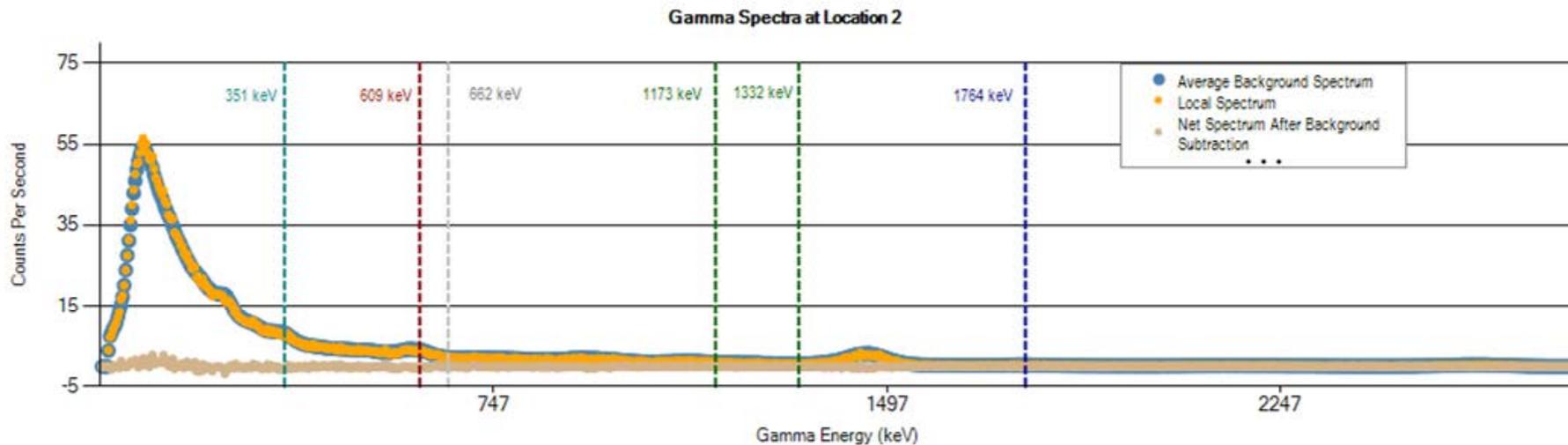
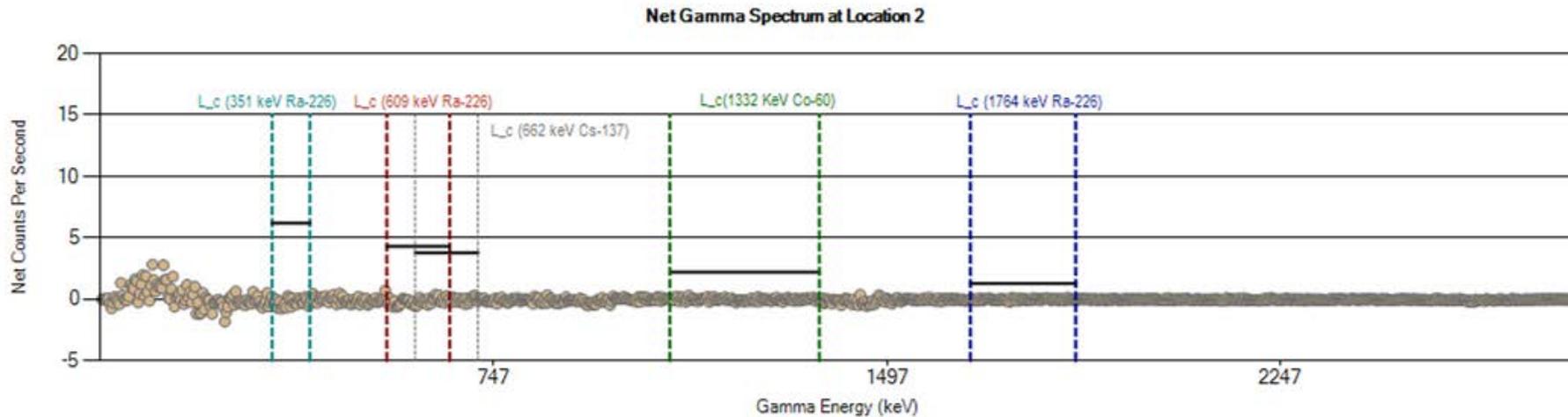


Coordinate system: CSP Zone III. NAD83, US Survey Foot



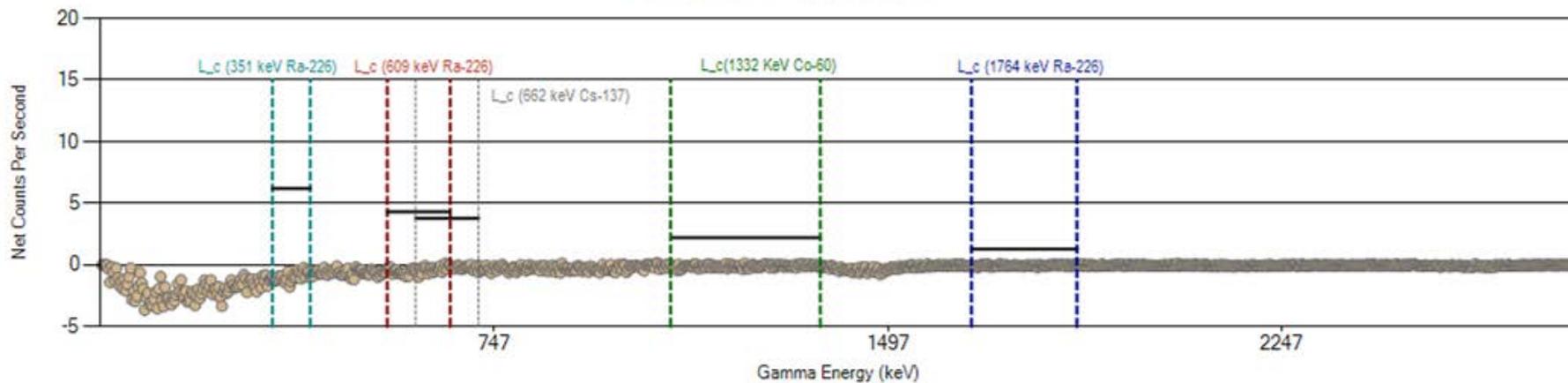


	ROI1	ROI2	ROI3	ROI4	ROI5	ROI6	ROI7	ROI8	ROI9	ROI10
Location 1 (cps)	807	105	19	19	145	130	102	166	87	3545
Static IL (cps)	1052	150	35	41	201	189	146	229	120	4255

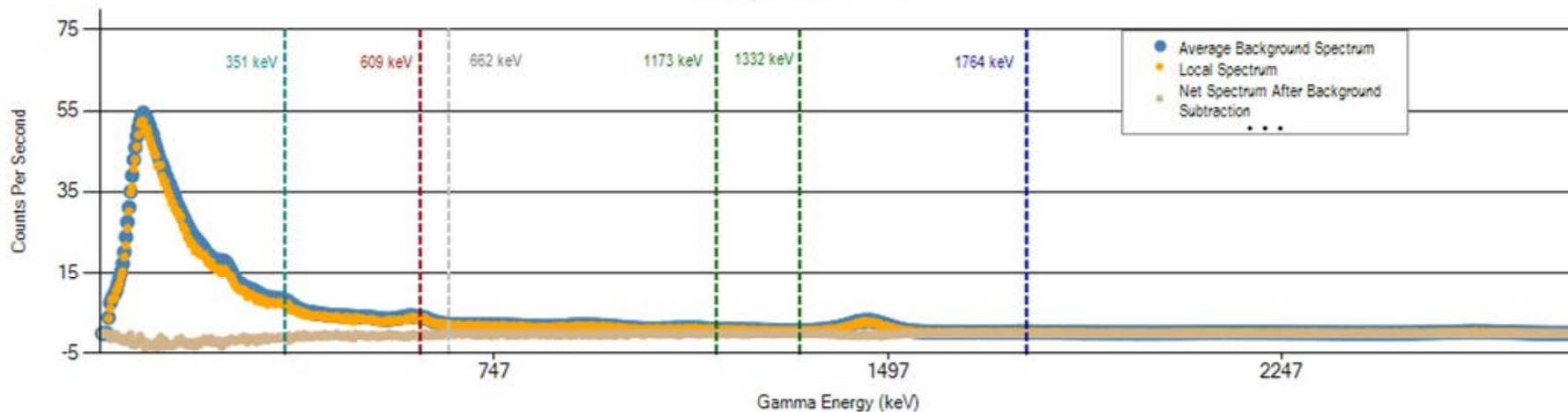


	ROI1	ROI2	ROI3	ROI4	ROI5	ROI6	ROI7	ROI8	ROI9	ROI10
Location 2 (cps)	818	108	20	19	145	134	105	168	87	3590
Static IL (cps)	1052	150	35	41	201	189	146	229	120	4255

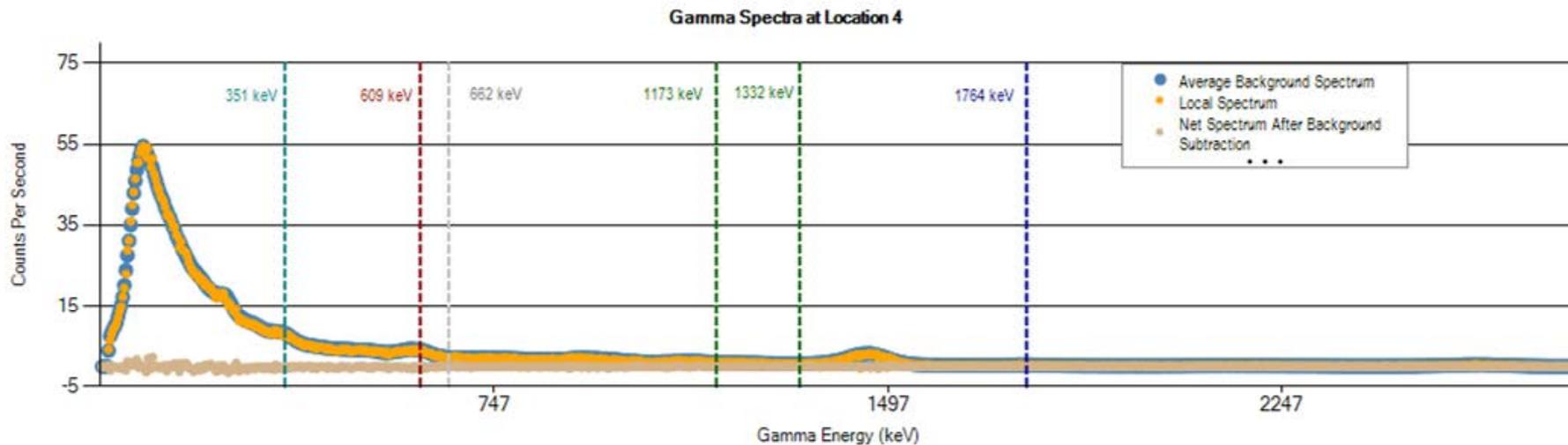
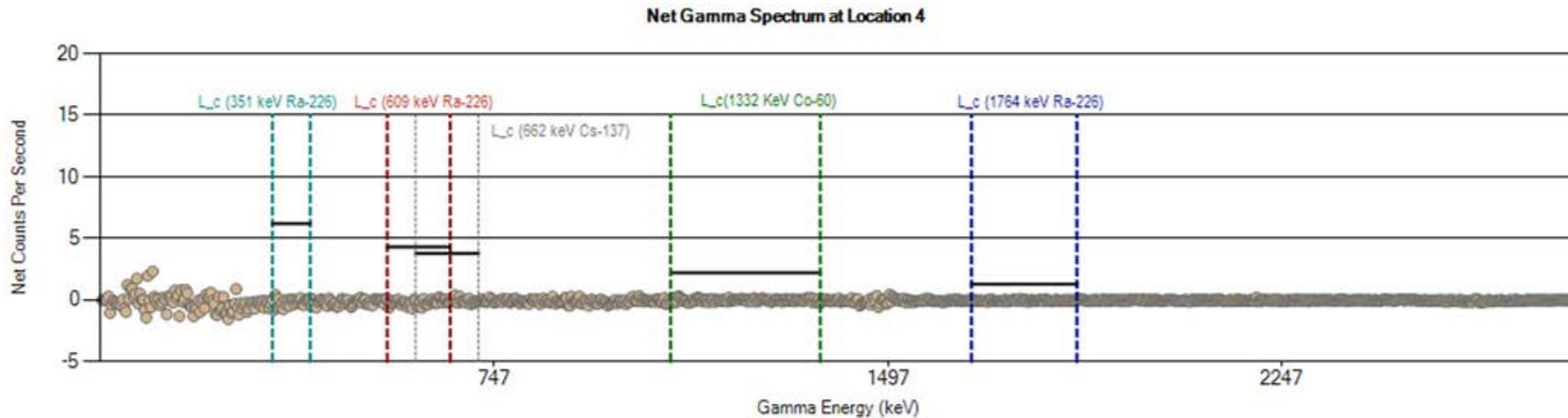
Net Gamma Spectrum at Location 3



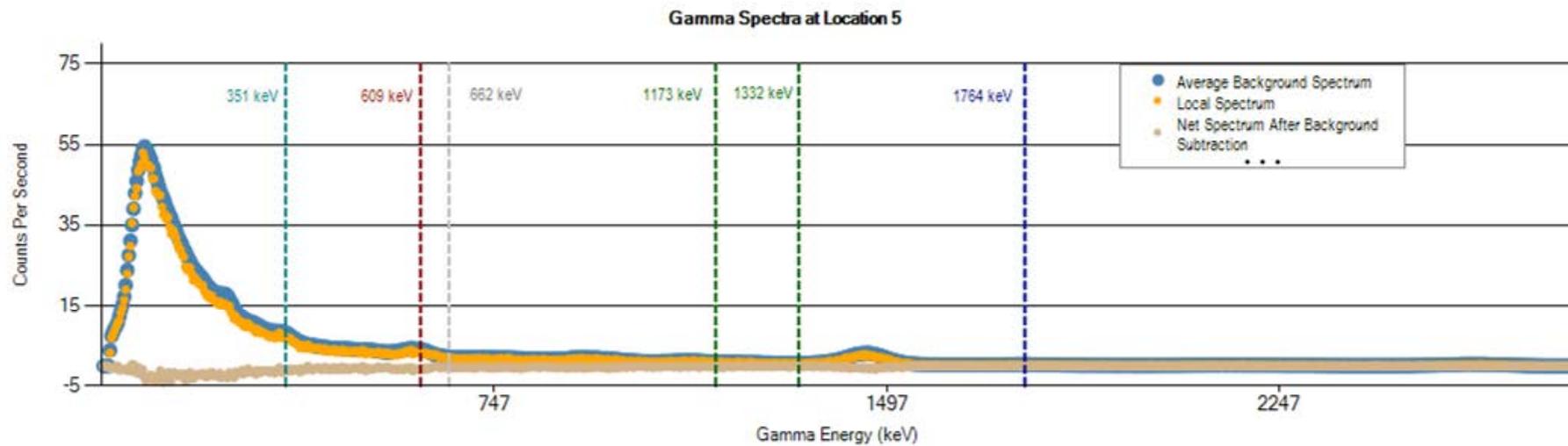
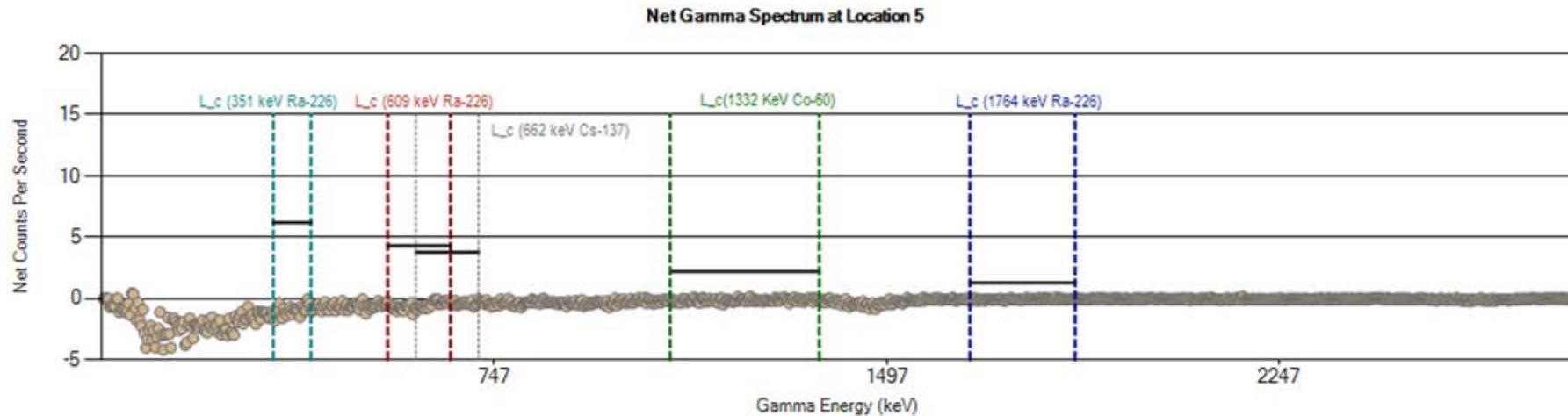
Gamma Spectra at Location 3



	ROI1	ROI2	ROI3	ROI4	ROI5	ROI6	ROI7	ROI8	ROI9	ROI10
Location 3 (cps)	730	96	17	18	128	123	96	150	79	3259
Static IL (cps)	1052	150	35	41	201	189	146	229	120	4255

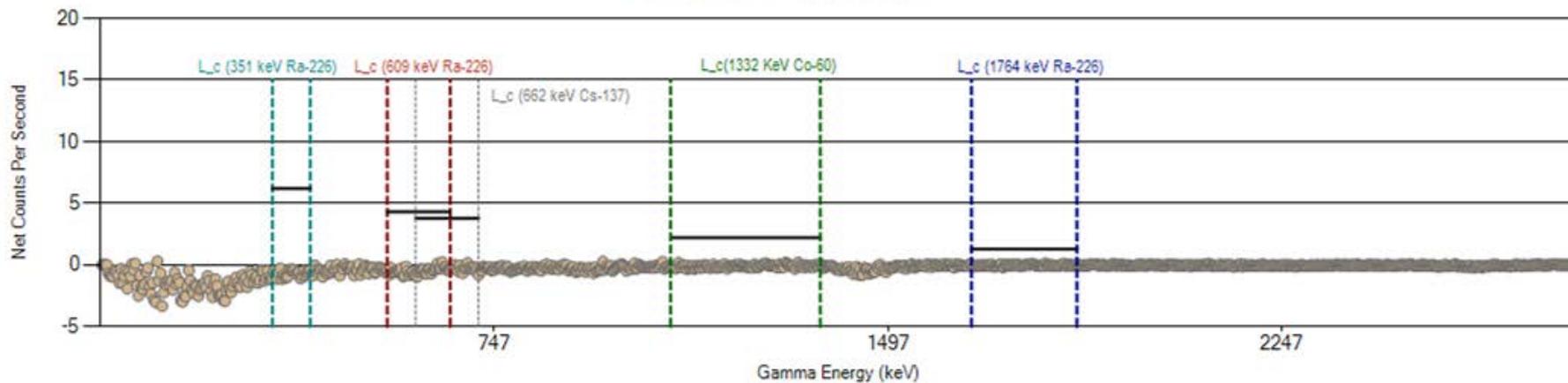


	ROI1	ROI2	ROI3	ROI4	ROI5	ROI6	ROI7	ROI8	ROI9	ROI10
Location 4 (cps)	814	111	18	20	146	132	103	170	88	3546
Static IL (cps)	1052	150	35	41	201	189	146	229	120	4255

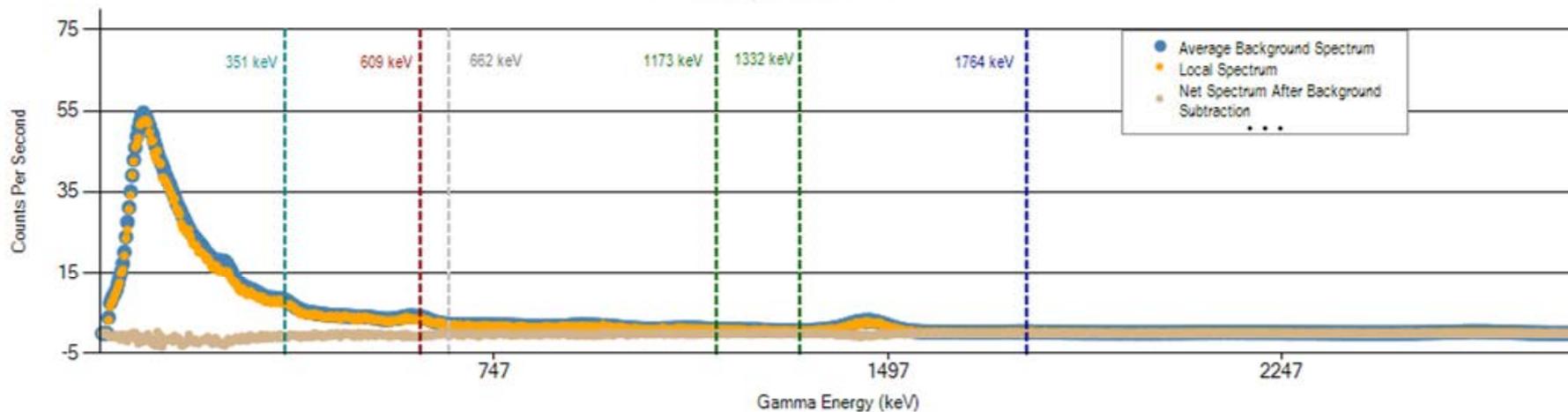


	ROI1	ROI2	ROI3	ROI4	ROI5	ROI6	ROI7	ROI8	ROI9	ROI10
Location 5 (cps)	709	94	16	17	127	118	91	150	76	3241
Static IL (cps)	1052	150	35	41	201	189	146	229	120	4255

Net Gamma Spectrum at Location 6

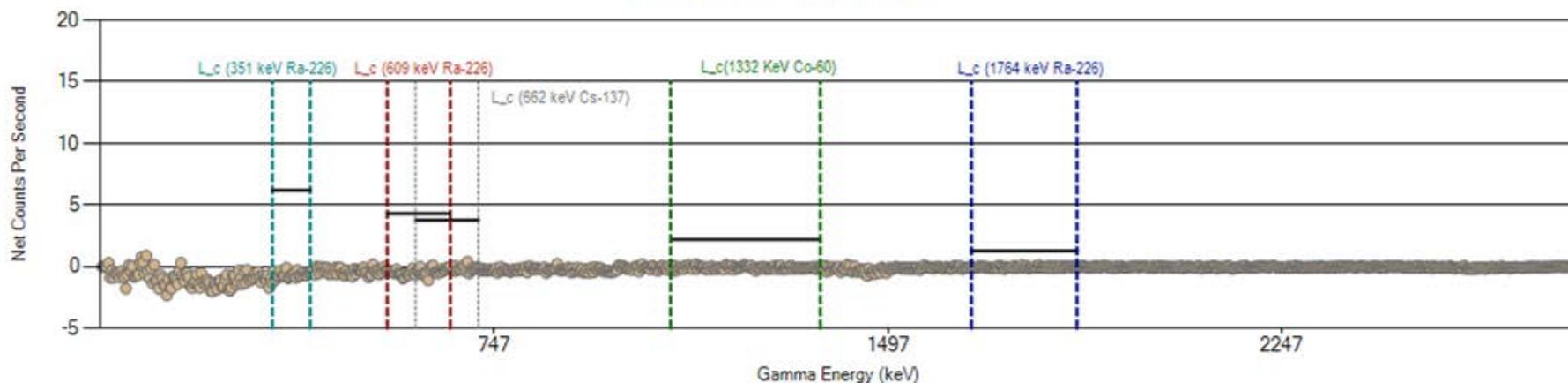


Gamma Spectra at Location 6

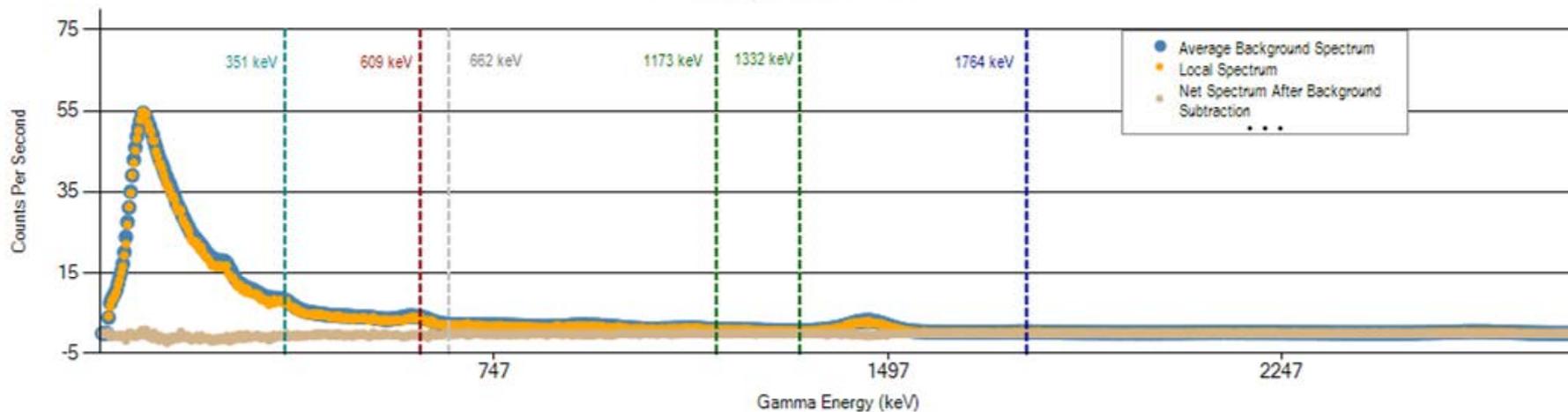


	ROI1	ROI2	ROI3	ROI4	ROI5	ROI6	ROI7	ROI8	ROI9	ROI10
Location 6 (cps)	743	97	19	18	137	121	94	157	79	3331
Static IL (cps)	1052	150	35	41	201	189	146	229	120	4255

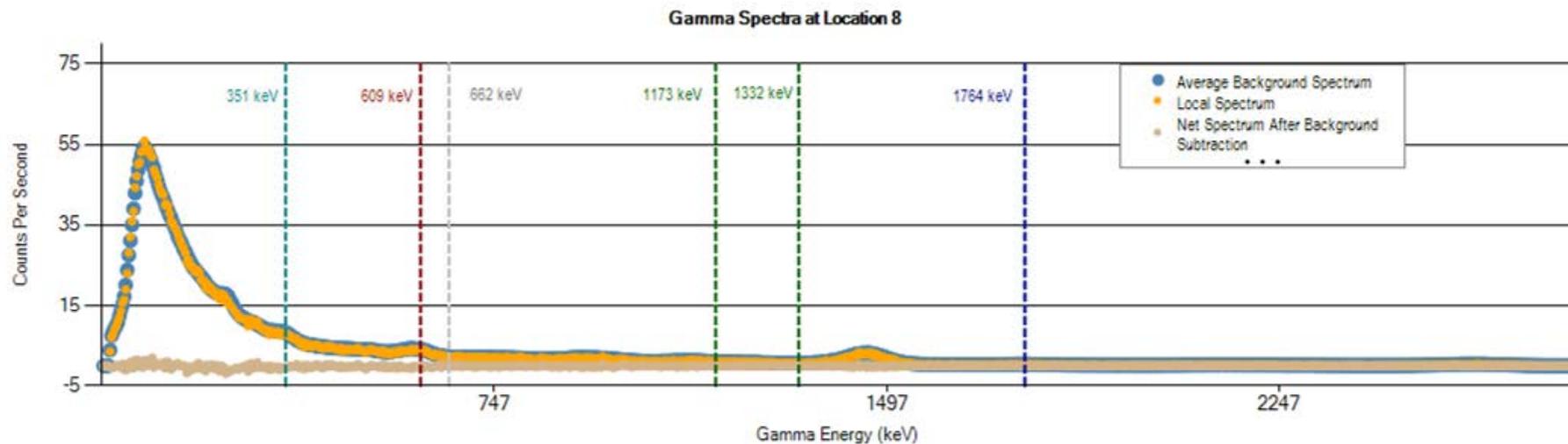
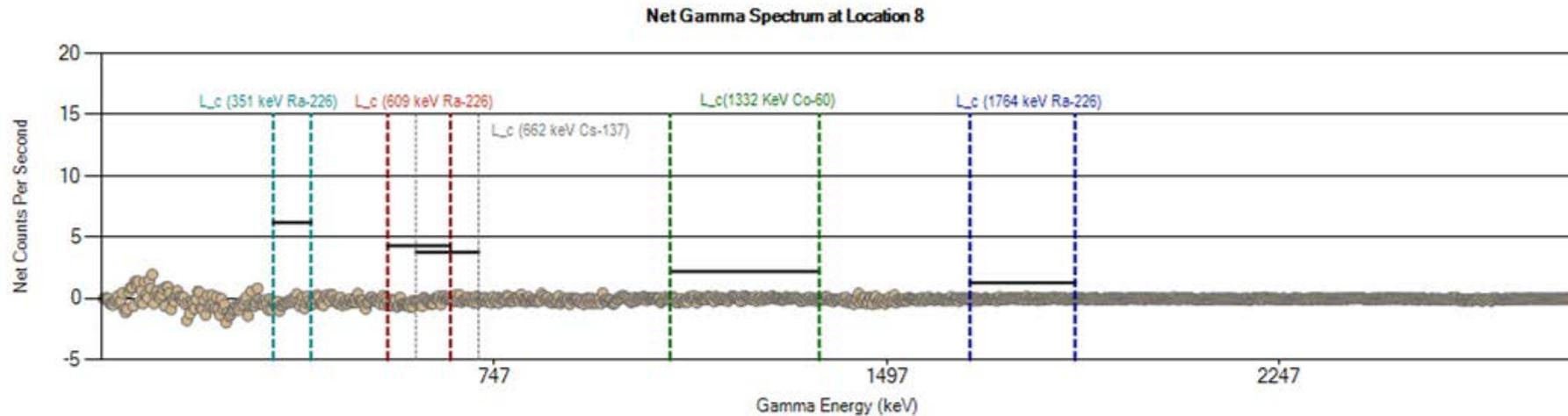
Net Gamma Spectrum at Location 7



Gamma Spectra at Location 7

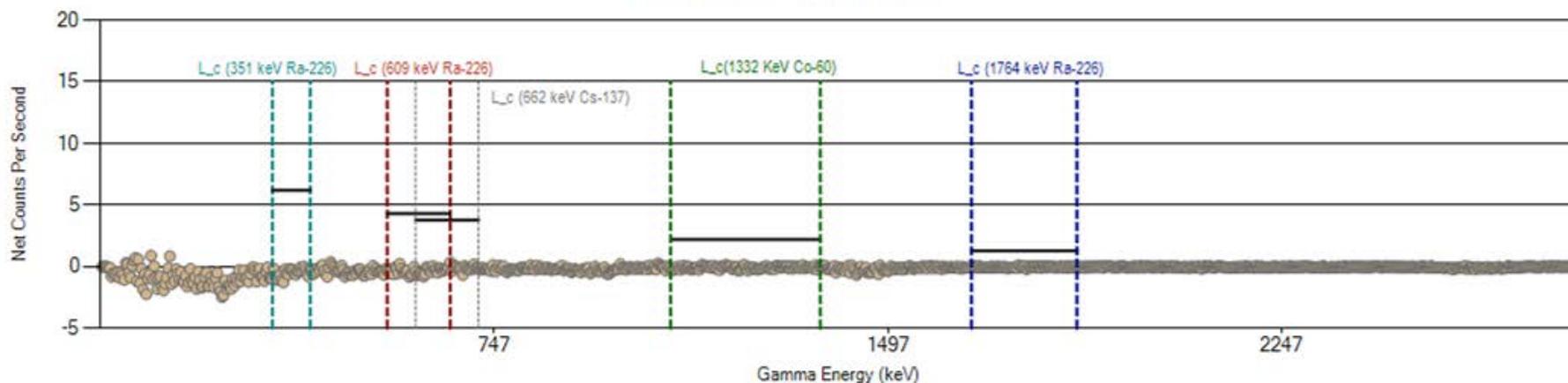


	ROI1	ROI2	ROI3	ROI4	ROI5	ROI6	ROI7	ROI8	ROI9	ROI10
Location 7 (cps)	759	102	18	19	135	123	97	159	82	3403
Static IL (cps)	1052	150	35	41	201	189	146	229	120	4255

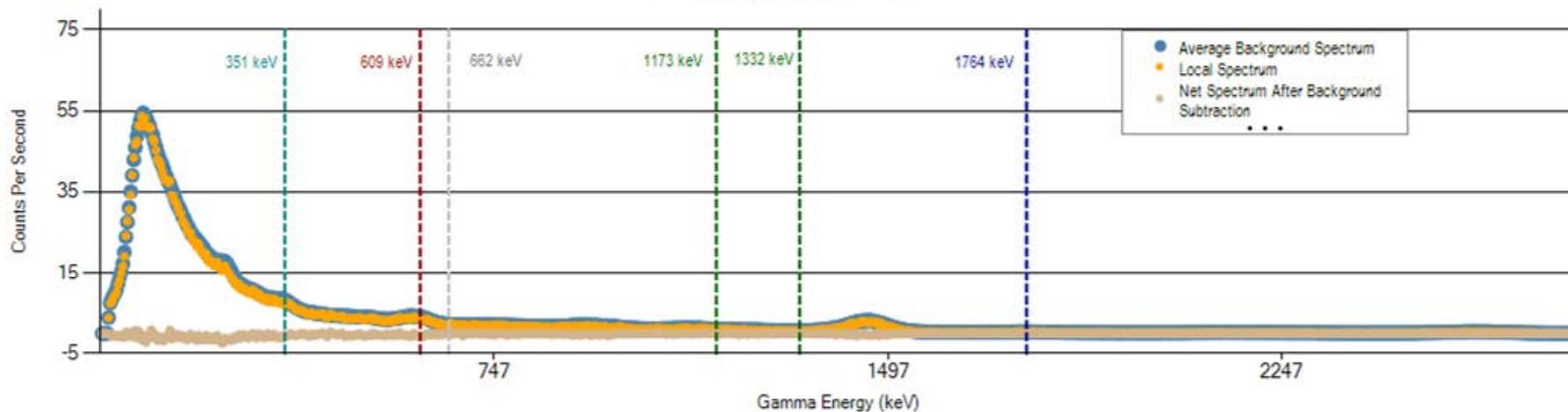


	ROI1	ROI2	ROI3	ROI4	ROI5	ROI6	ROI7	ROI8	ROI9	ROI10
Location 8 (cps)	806	108	19	20	142	130	103	166	86	3537
Static IL (cps)	1052	150	35	41	201	189	146	229	120	4255

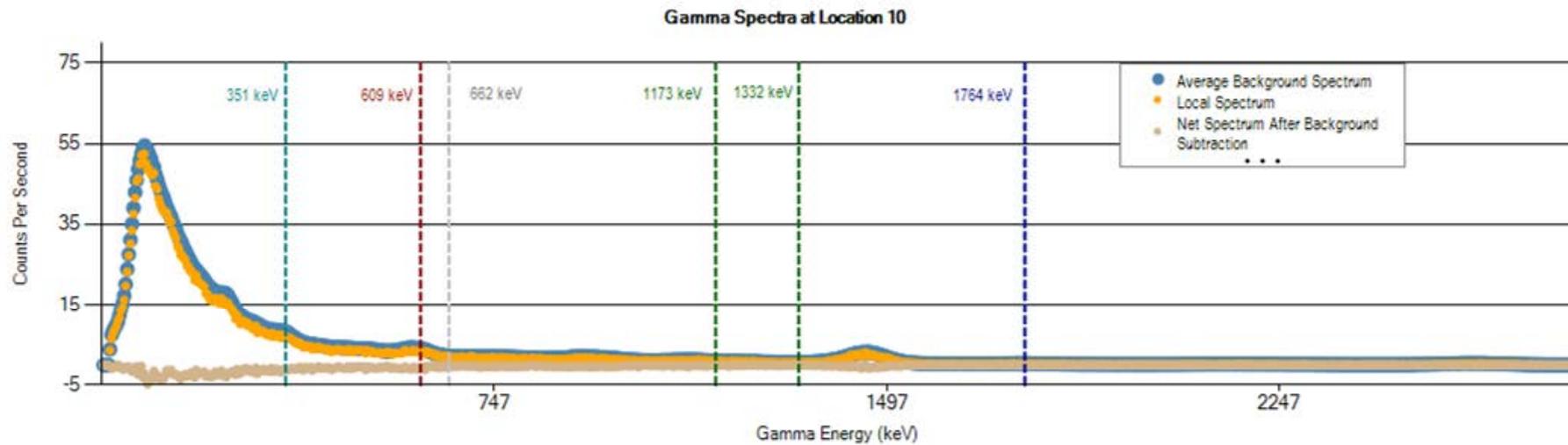
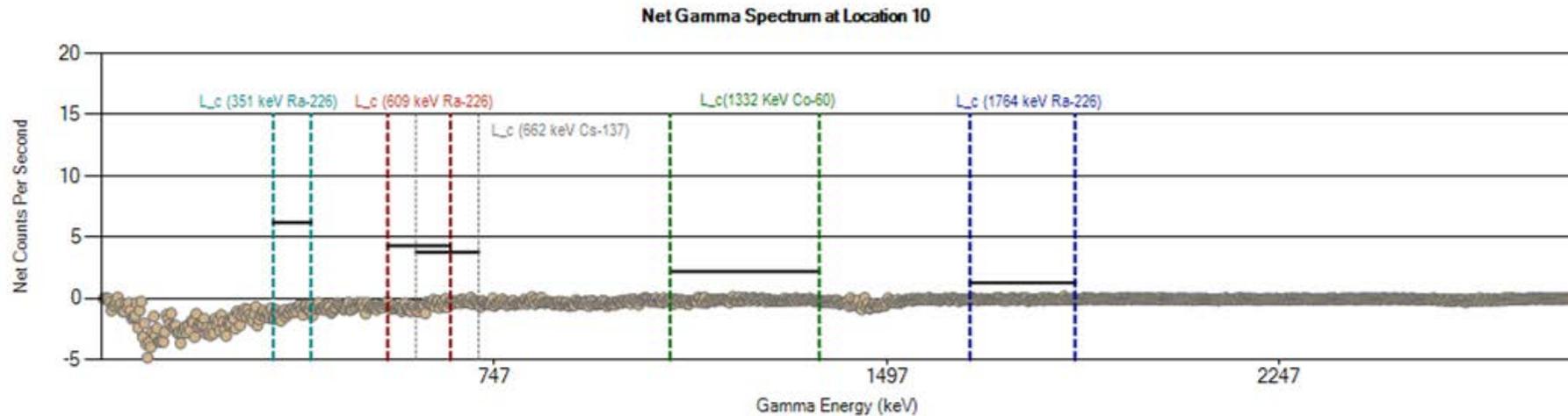
Net Gamma Spectrum at Location 9



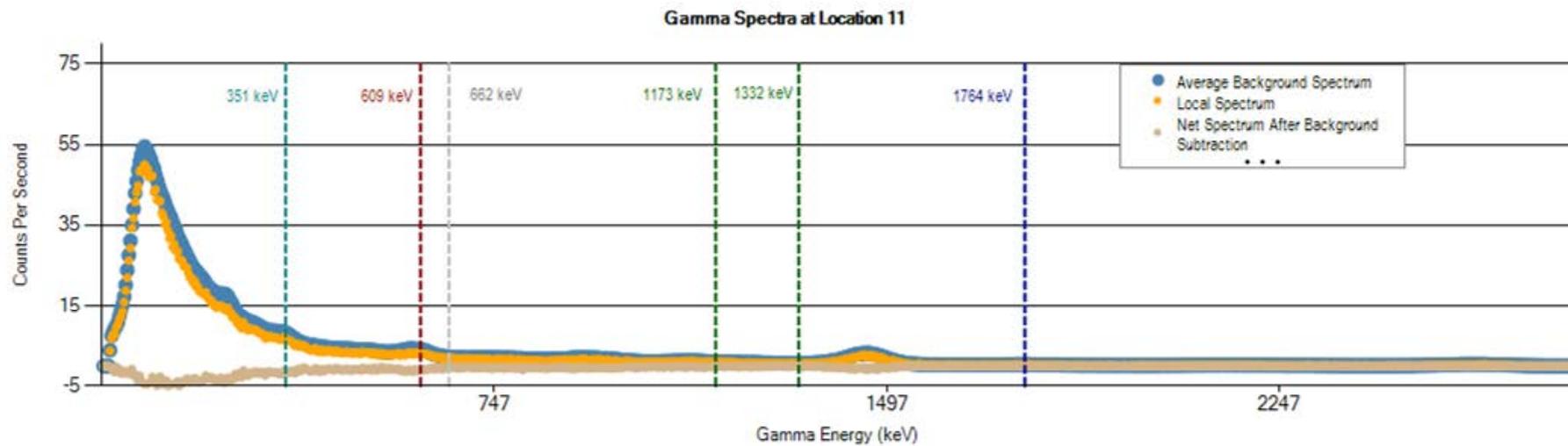
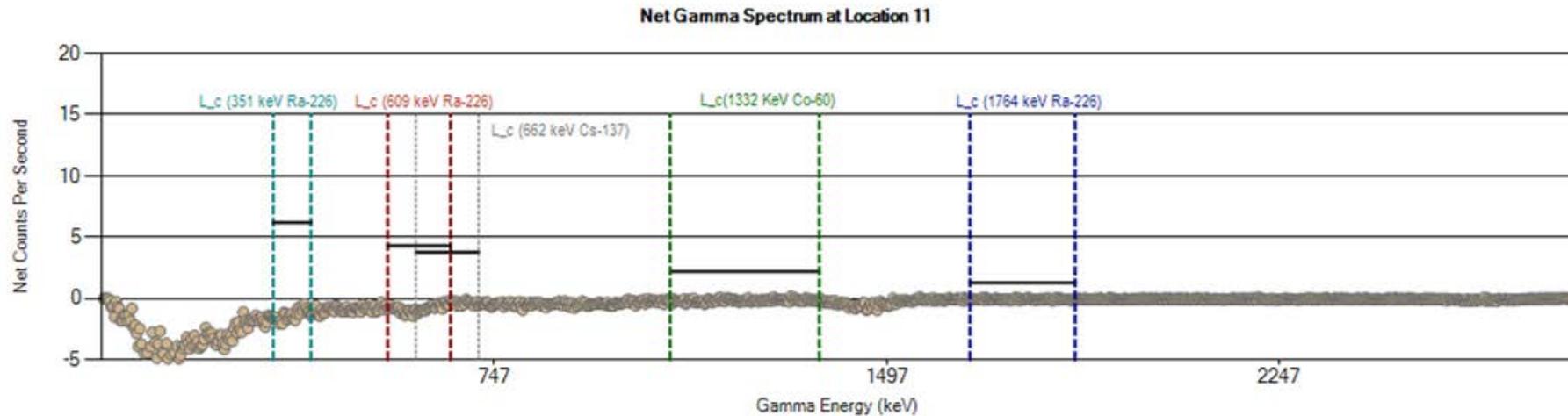
Gamma Spectra at Location 9



	ROI1	ROI2	ROI3	ROI4	ROI5	ROI6	ROI7	ROI8	ROI9	ROI10
Location 9 (cps)	773	103	19	19	137	127	98	162	82	3427
Static IL (cps)	1052	150	35	41	201	189	146	229	120	4255

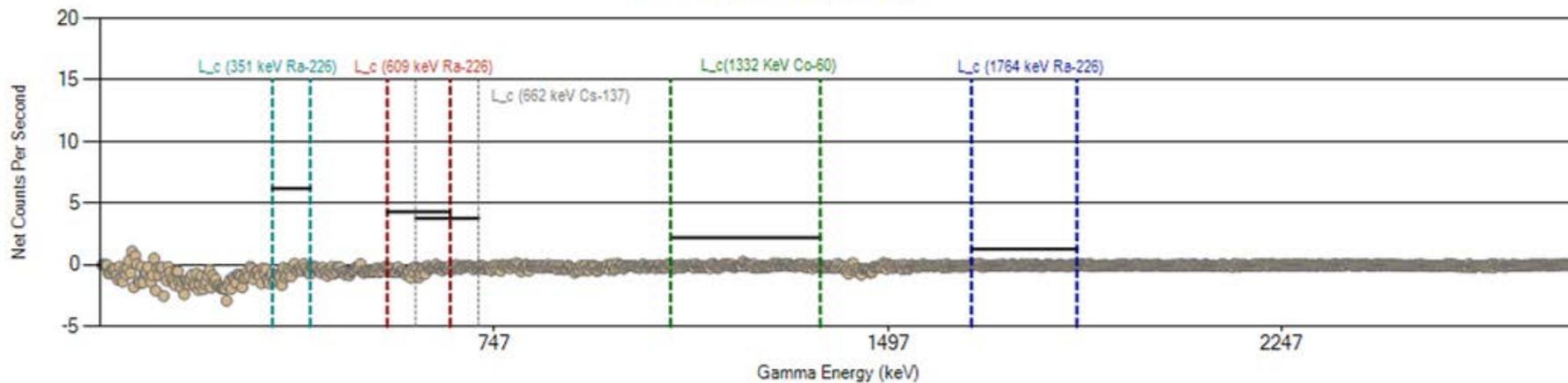


	ROI1	ROI2	ROI3	ROI4	ROI5	ROI6	ROI7	ROI8	ROI9	ROI10
Location 10 (cps)	707	95	17	17	126	115	91	148	76	3240
Static IL (cps)	1052	150	35	41	201	189	146	229	120	4255

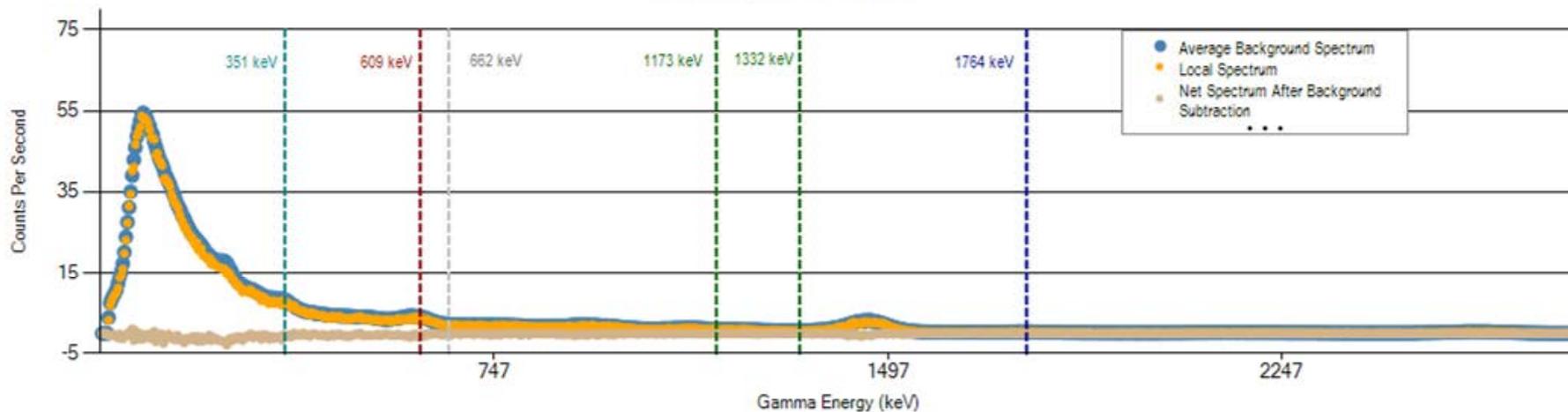


	ROI1	ROI2	ROI3	ROI4	ROI5	ROI6	ROI7	ROI8	ROI9	ROI10
Location 11 (cps)	668	90	16	17	119	108	86	141	74	3079
Static IL (cps)	1052	150	35	41	201	189	146	229	120	4255

Net Gamma Spectrum at Location 12

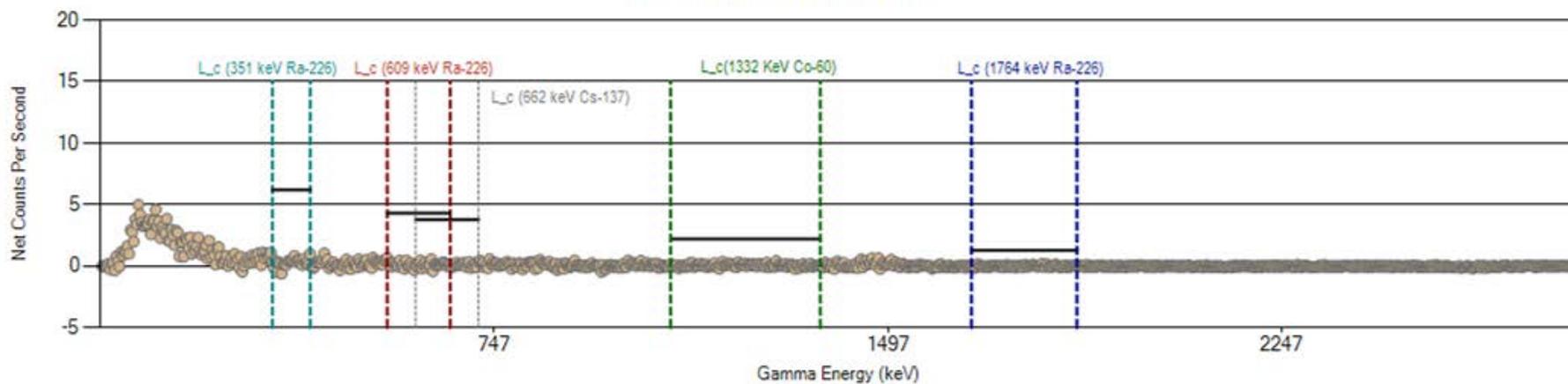


Gamma Spectra at Location 12

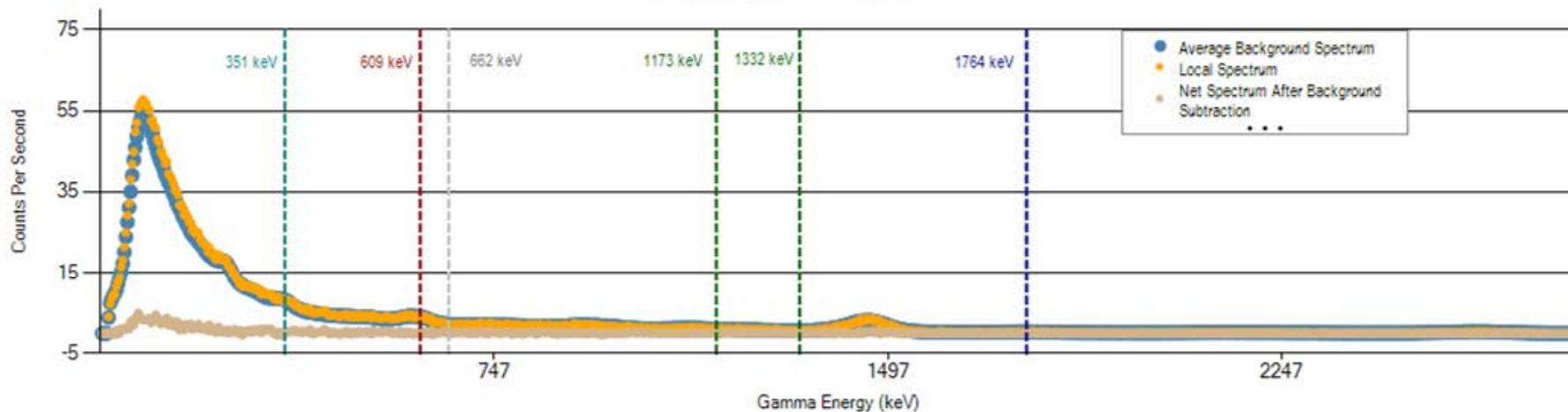


	ROI1	ROI2	ROI3	ROI4	ROI5	ROI6	ROI7	ROI8	ROI9	ROI10
Location 12 (cps)	760	101	18	19	134	124	97	160	81	3396
Static IL (cps)	1052	150	35	41	201	189	146	229	120	4255

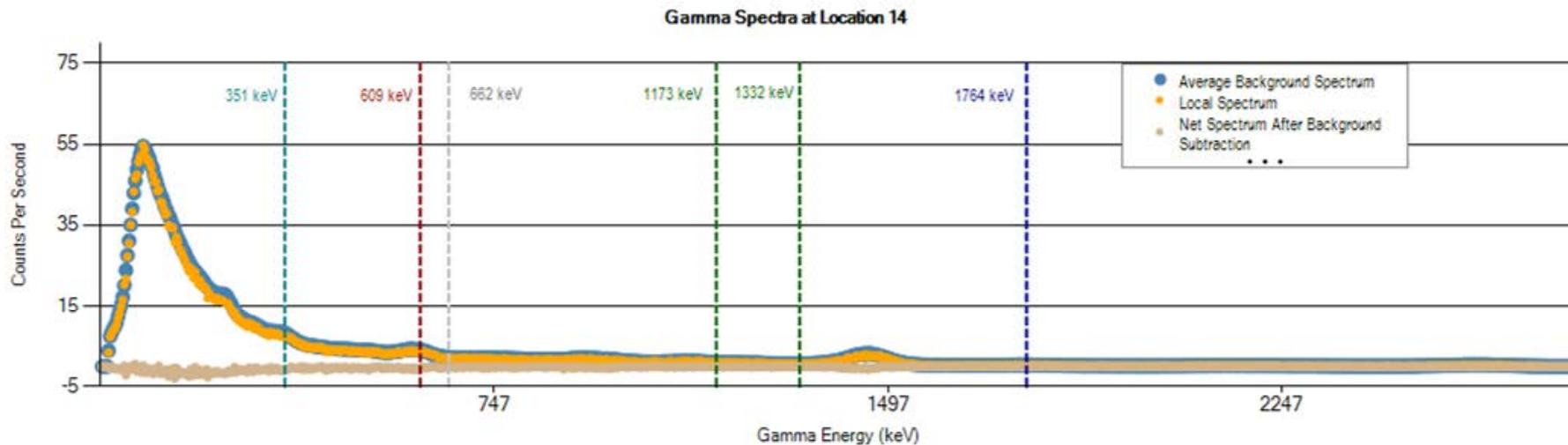
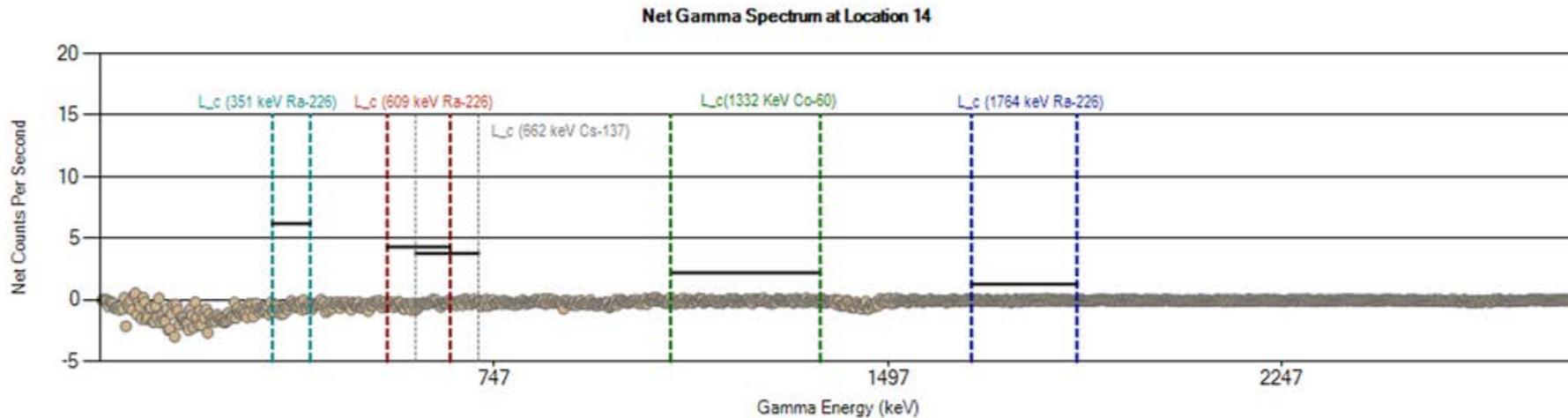
Net Gamma Spectrum at Location 13



Gamma Spectra at Location 13

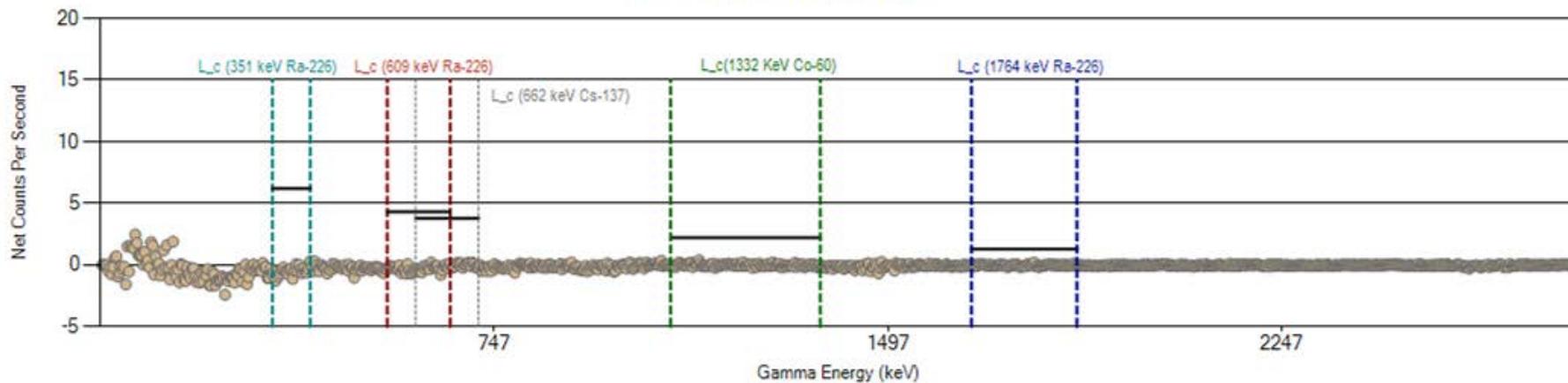


	ROI1	ROI2	ROI3	ROI4	ROI5	ROI6	ROI7	ROI8	ROI9	ROI10
Location 13 (cps)	893	123	21	21	160	145	113	181	95	3816
Static IL (cps)	1052	150	35	41	201	189	146	229	120	4255

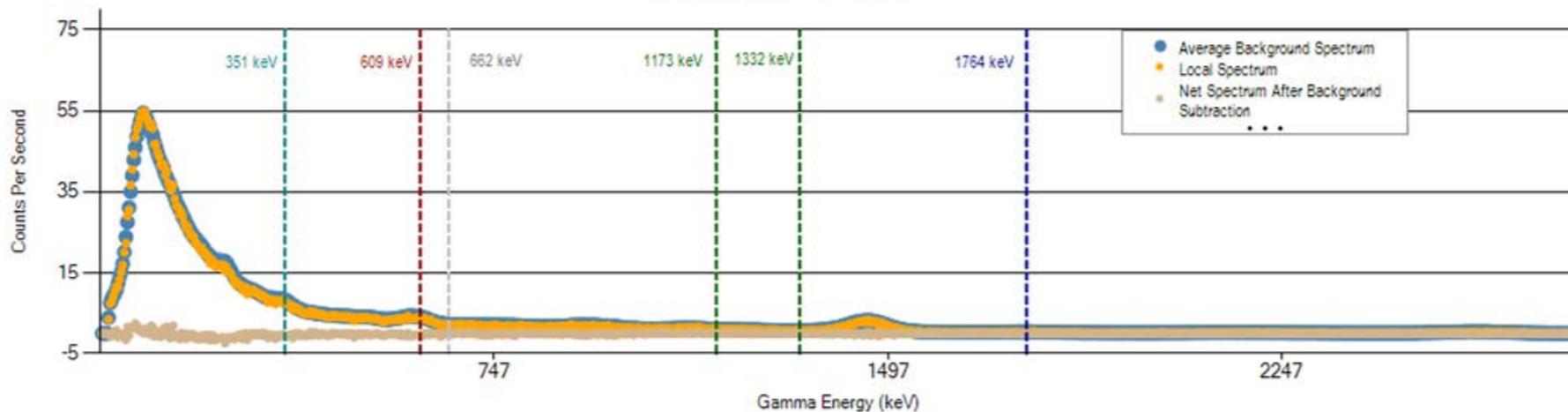


	ROI1	ROI2	ROI3	ROI4	ROI5	ROI6	ROI7	ROI8	ROI9	ROI10
Location 14 (cps)	761	101	18	18	137	126	98	160	81	3390
Static IL (cps)	1052	150	35	41	201	189	146	229	120	4255

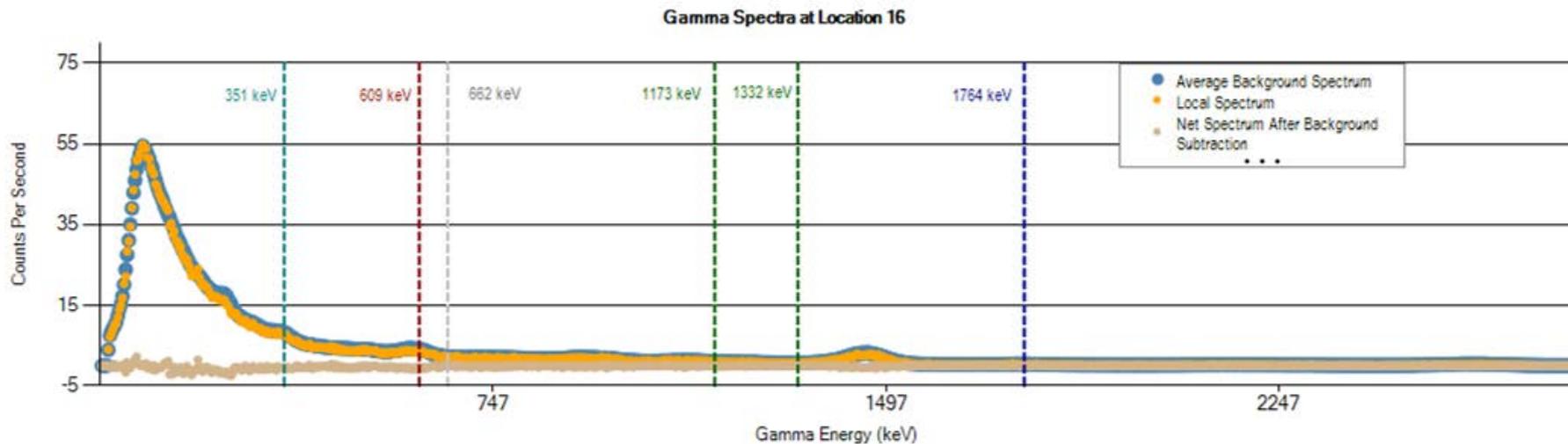
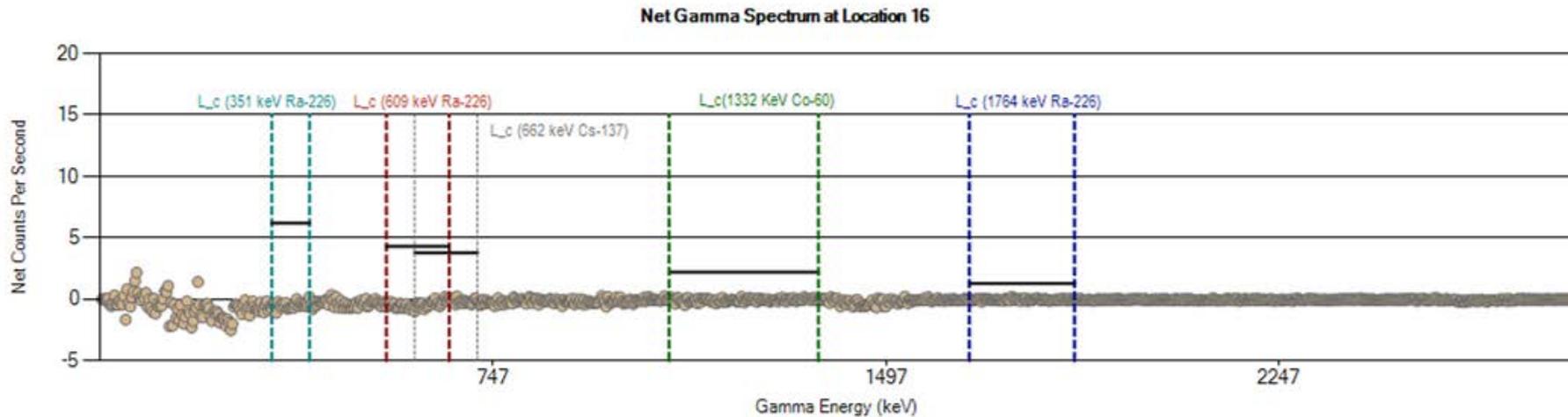
Net Gamma Spectrum at Location 15



Gamma Spectra at Location 15

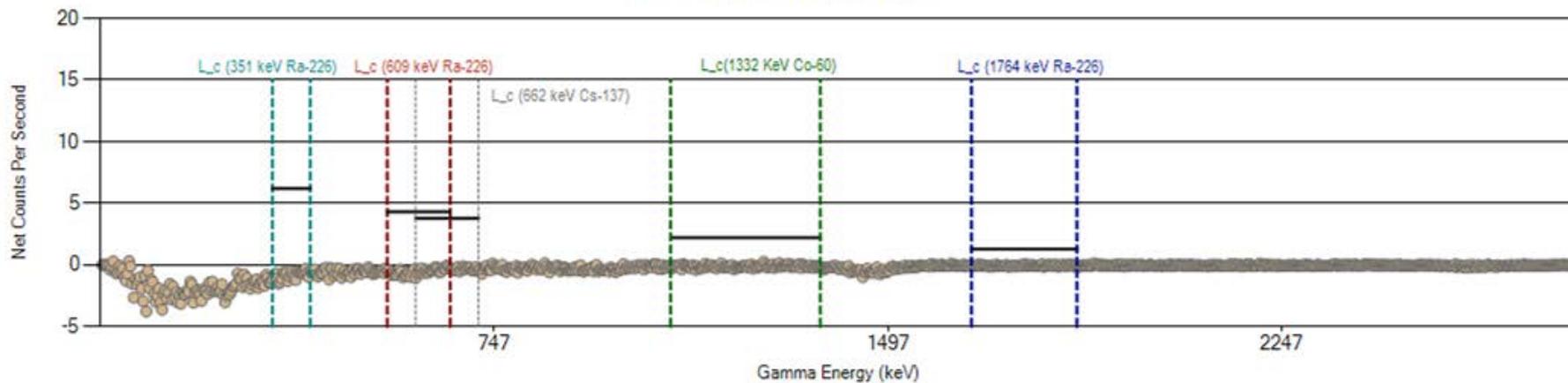


	ROI1	ROI2	ROI3	ROI4	ROI5	ROI6	ROI7	ROI8	ROI9	ROI10
Location 15 (cps)	793	107	19	20	141	128	102	163	87	3503
Static IL (cps)	1052	150	35	41	201	189	146	229	120	4255

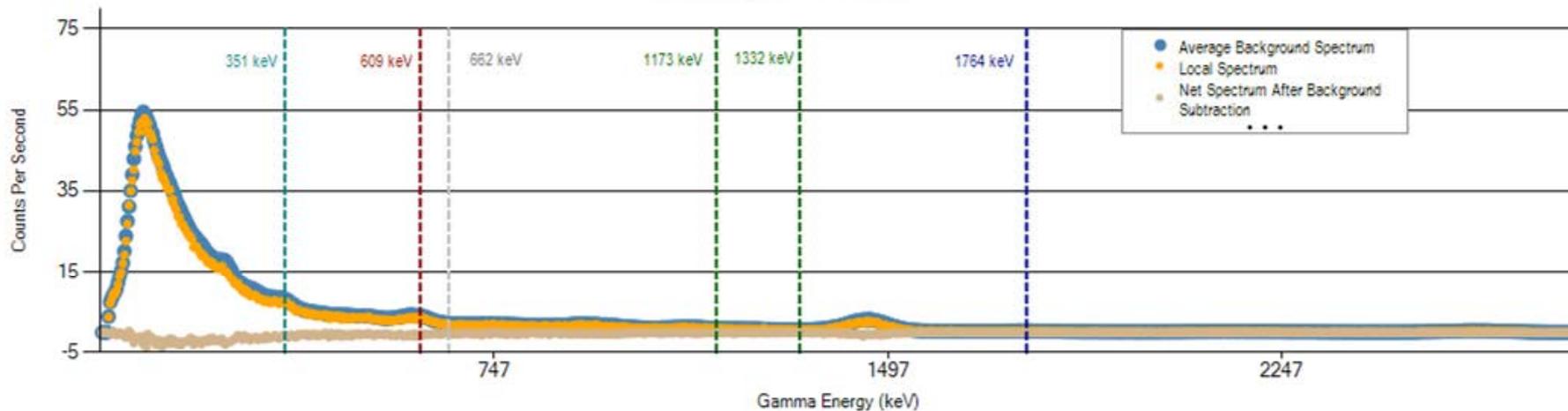


	ROI1	ROI2	ROI3	ROI4	ROI5	ROI6	ROI7	ROI8	ROI9	ROI10
Location 16 (cps)	770	101	19	19	136	124	98	163	83	3446
Static IL (cps)	1052	150	35	41	201	189	146	229	120	4255

Net Gamma Spectrum at Location 17

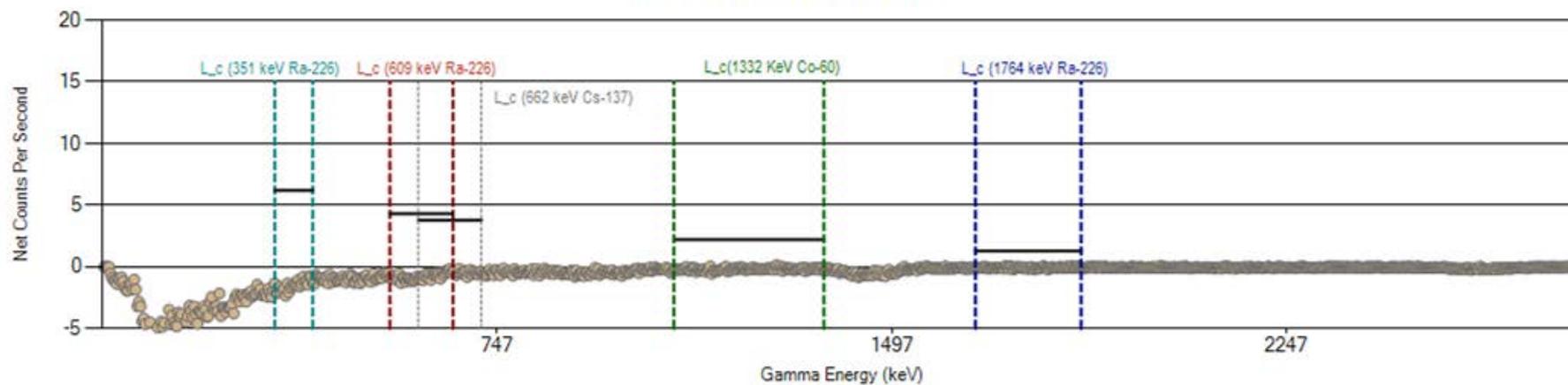


Gamma Spectra at Location 17

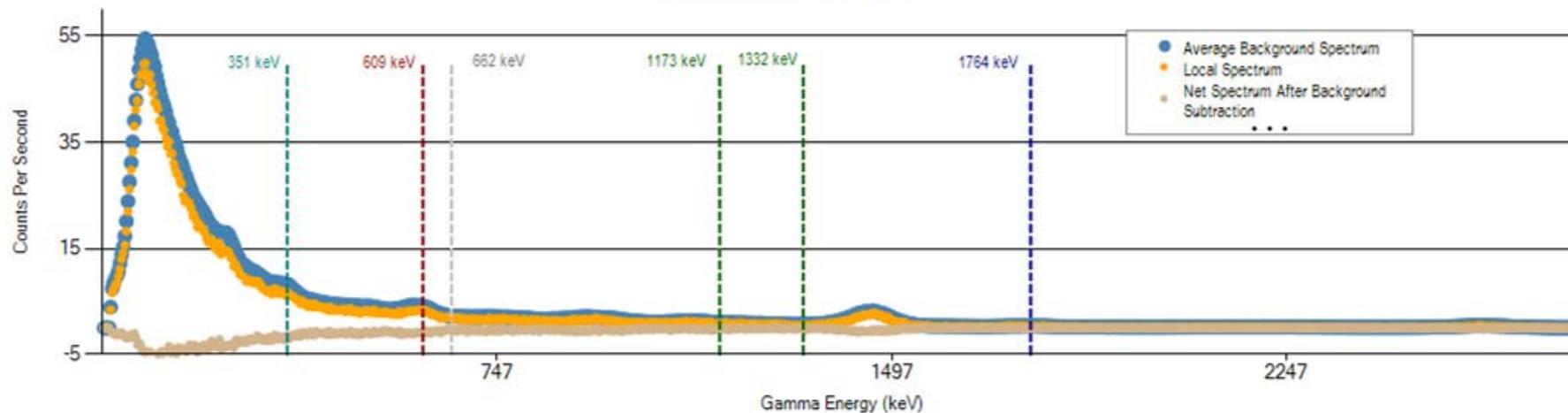


	ROI1	ROI2	ROI3	ROI4	ROI5	ROI6	ROI7	ROI8	ROI9	ROI10
Location 17 (cps)	724	94	17	18	129	119	93	154	78	3278
Static IL (cps)	1052	150	35	41	201	189	146	229	120	4255

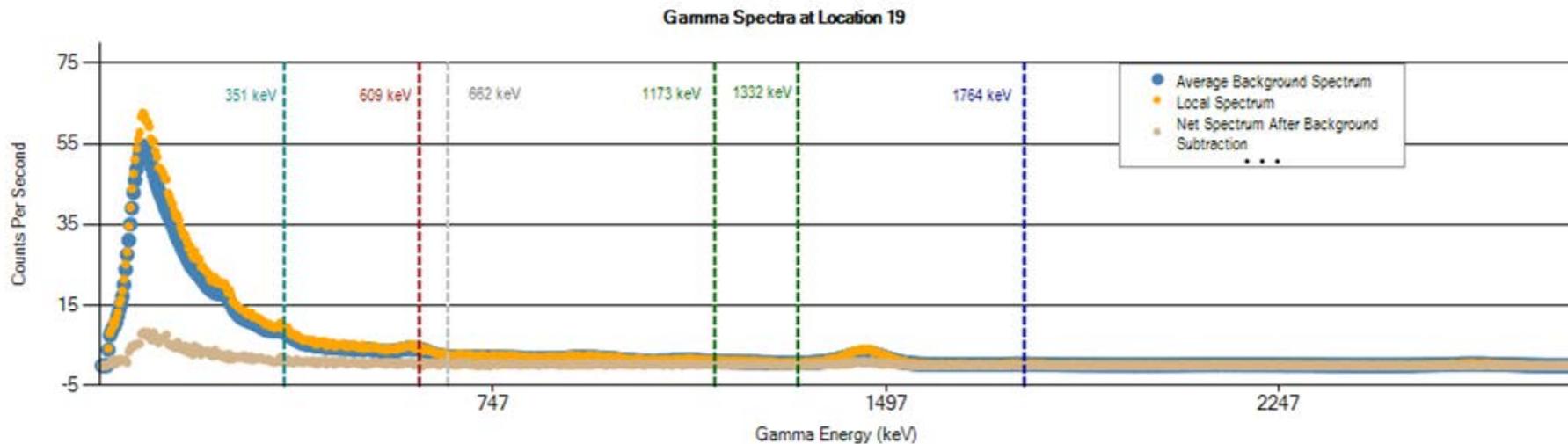
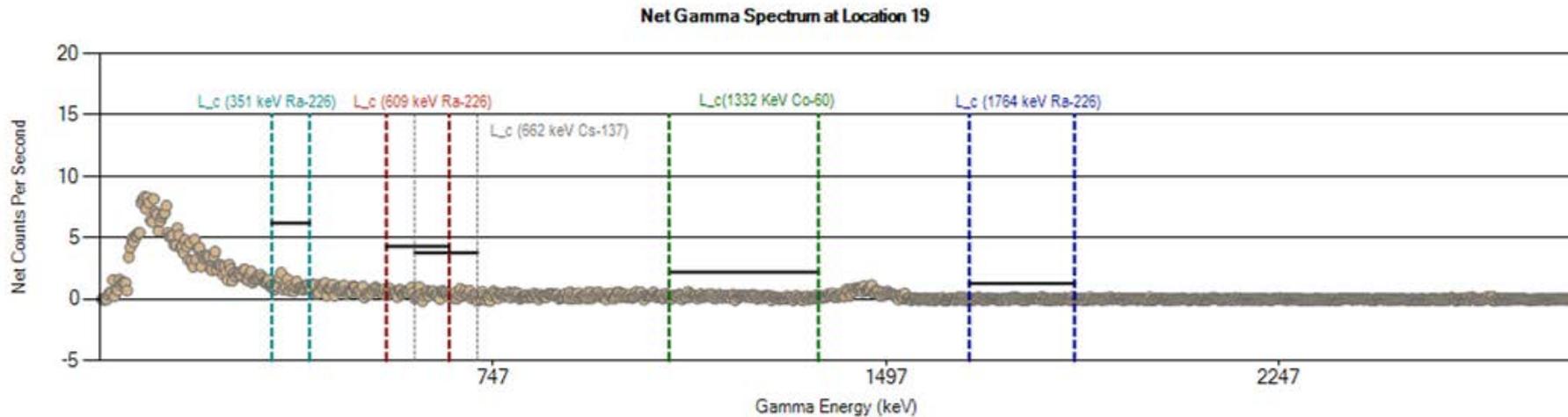
Net Gamma Spectrum at Location 18



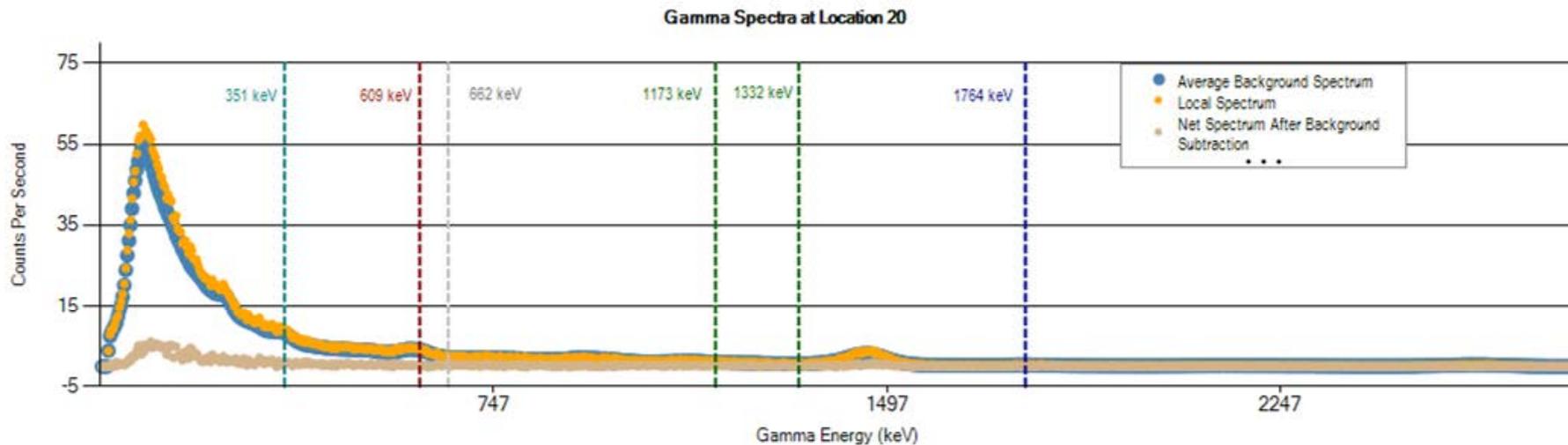
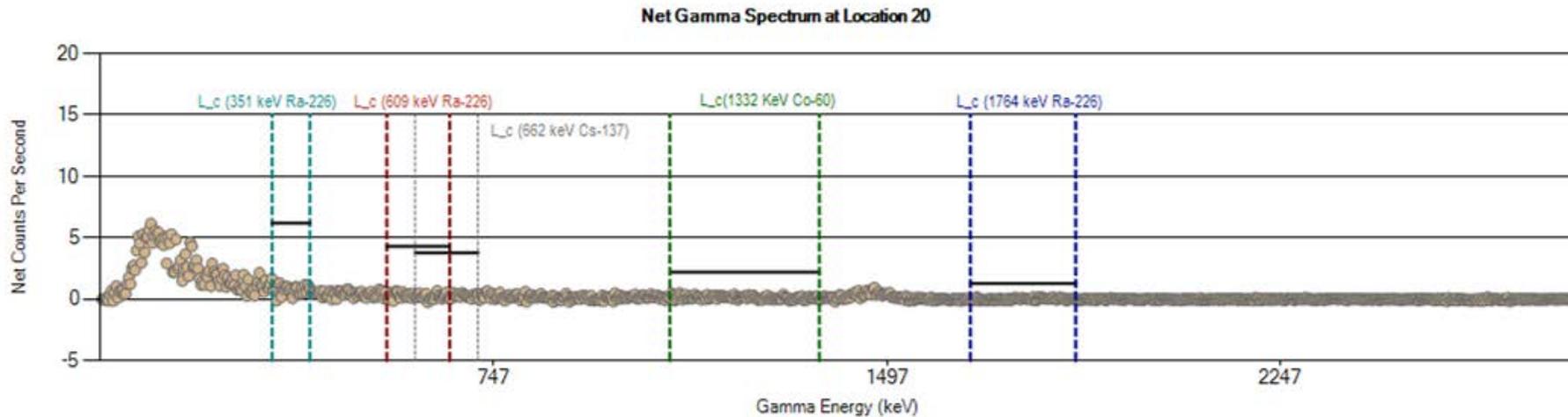
Gamma Spectra at Location 18



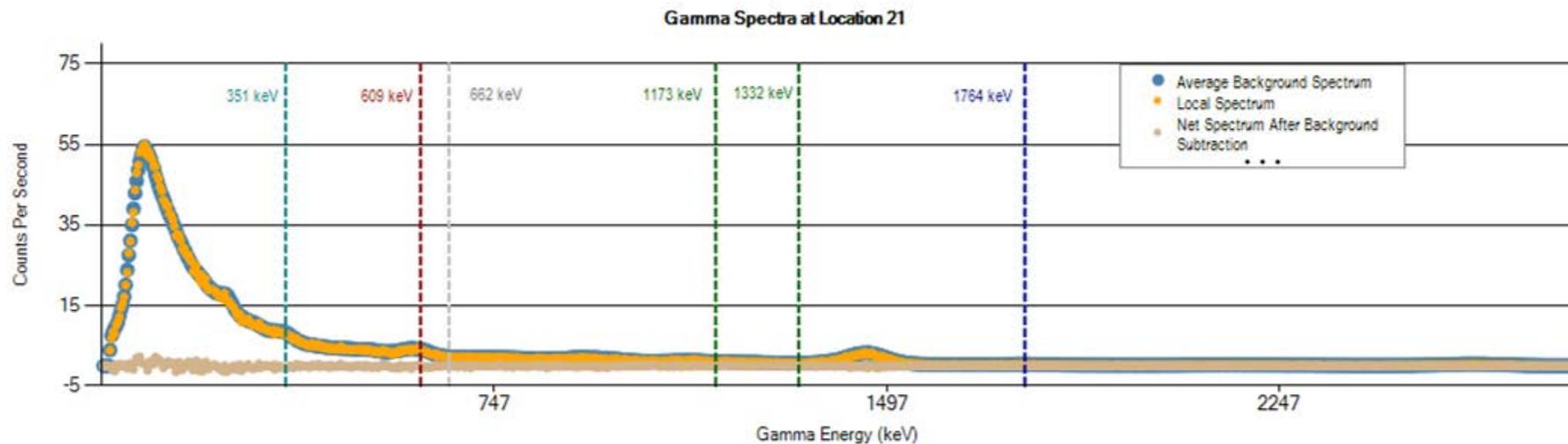
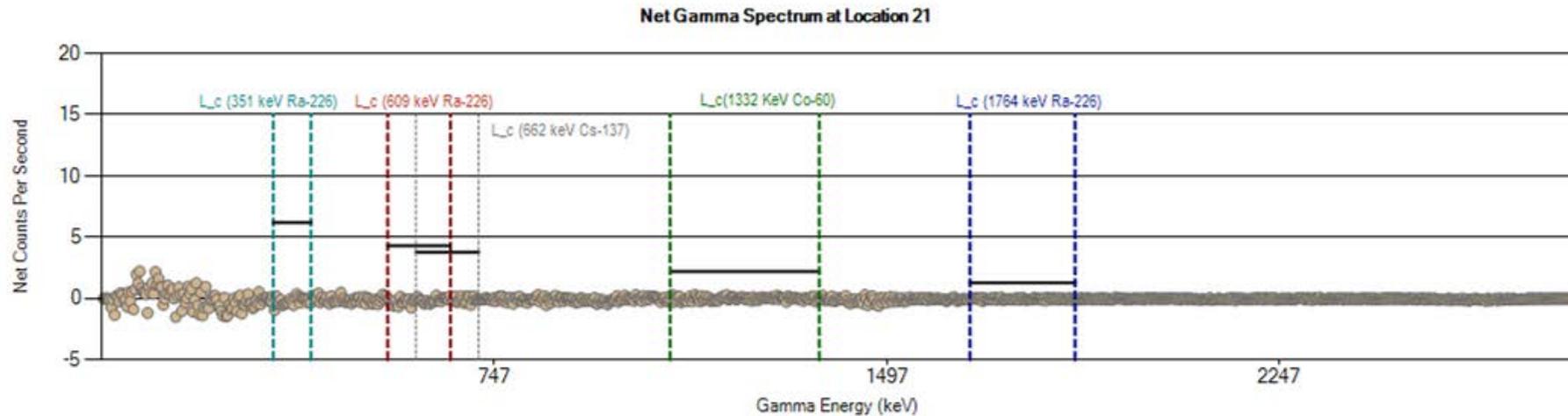
	ROI1	ROI2	ROI3	ROI4	ROI5	ROI6	ROI7	ROI8	ROI9	ROI10
Location 18 (cps)	658	90	16	15	116	109	85	137	71	3044
Static IL (cps)	1052	150	35	41	201	189	146	229	120	4255



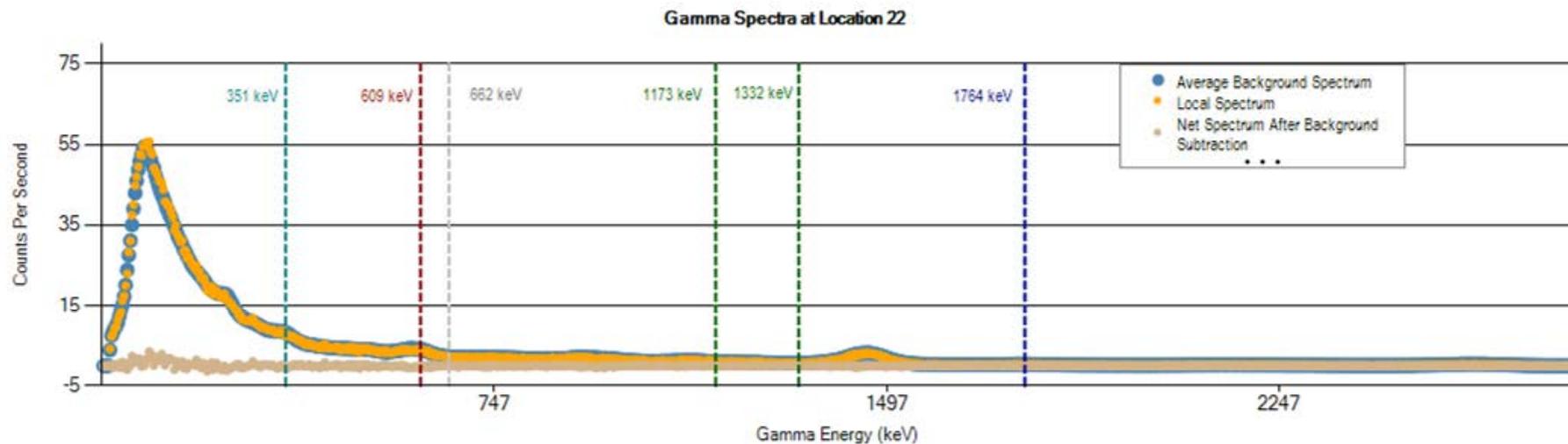
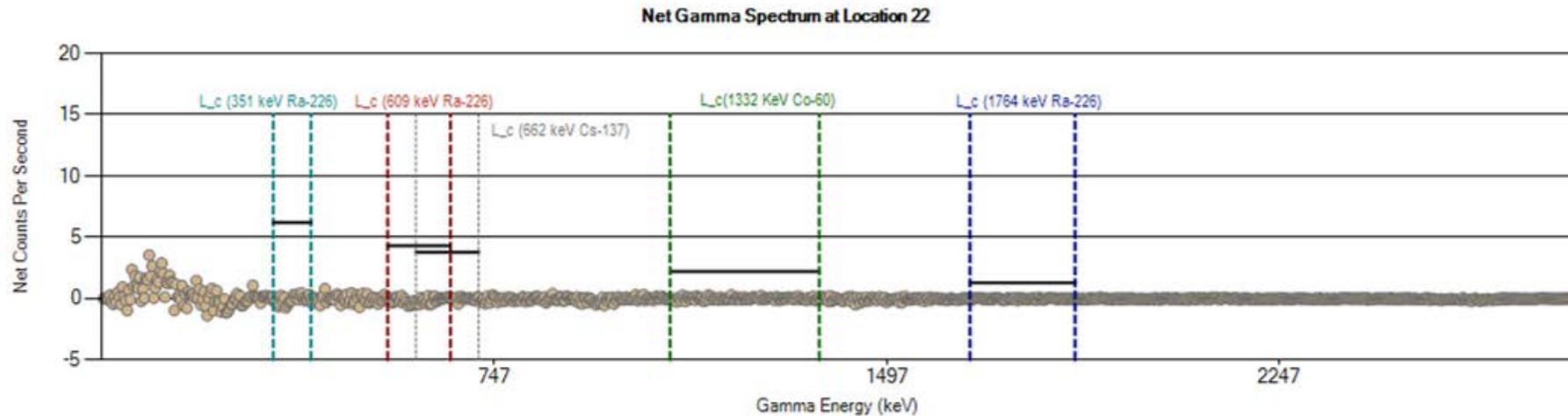
	ROI1	ROI2	ROI3	ROI4	ROI5	ROI6	ROI7	ROI8	ROI9	ROI10
Location 19 (cps)	998	141	22	25	176	161	124	201	108	4149
Static IL (cps)	1052	150	35	41	201	189	146	229	120	4255



	ROI1	ROI2	ROI3	ROI4	ROI5	ROI6	ROI7	ROI8	ROI9	ROI10
Location 20 (cps)	944	132	22	23	168	151	118	194	103	3964
Static IL (cps)	1052	150	35	41	201	189	146	229	120	4255

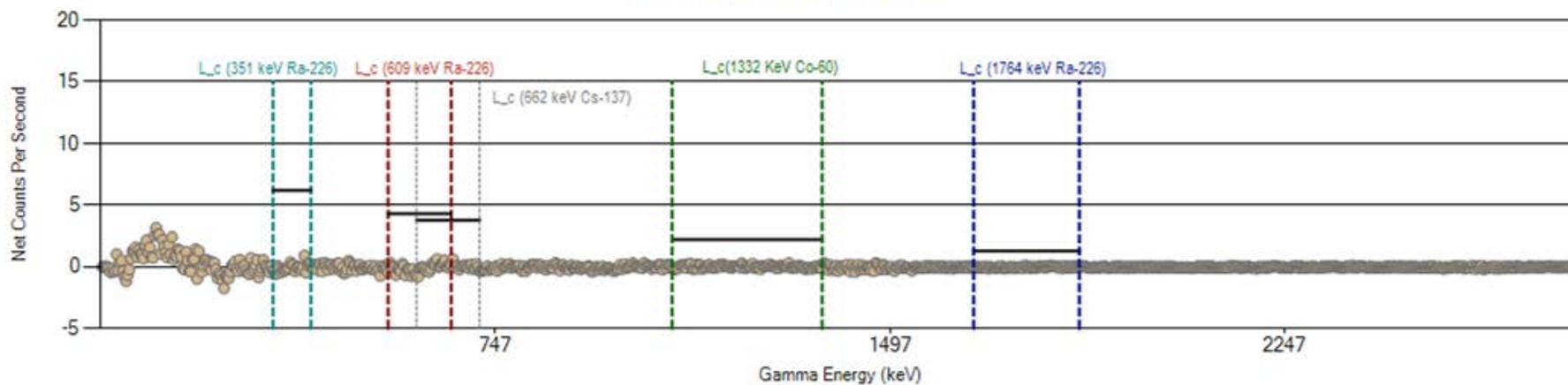


	ROI1	ROI2	ROI3	ROI4	ROI5	ROI6	ROI7	ROI8	ROI9	ROI10
Location 21 (cps)	815	108	18	19	145	132	103	170	89	3569
Static IL (cps)	1052	150	35	41	201	189	146	229	120	4255

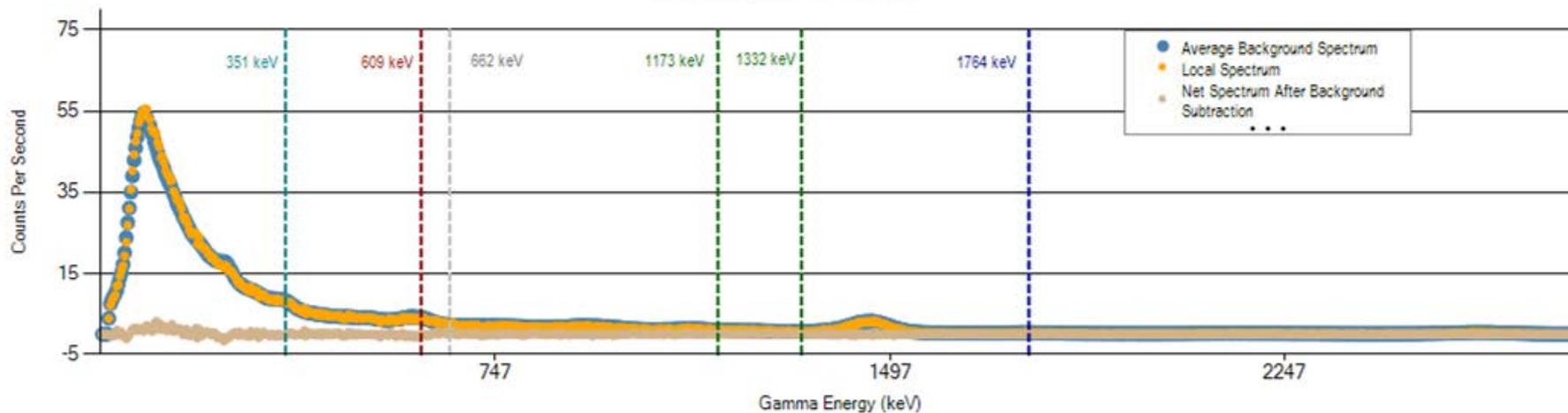


	ROI1	ROI2	ROI3	ROI4	ROI5	ROI6	ROI7	ROI8	ROI9	ROI10
Location 22 (cps)	830	111	19	19	150	134	105	172	89	3620
Static IL (cps)	1052	150	35	41	201	189	146	229	120	4255

Net Gamma Spectrum at Location 23

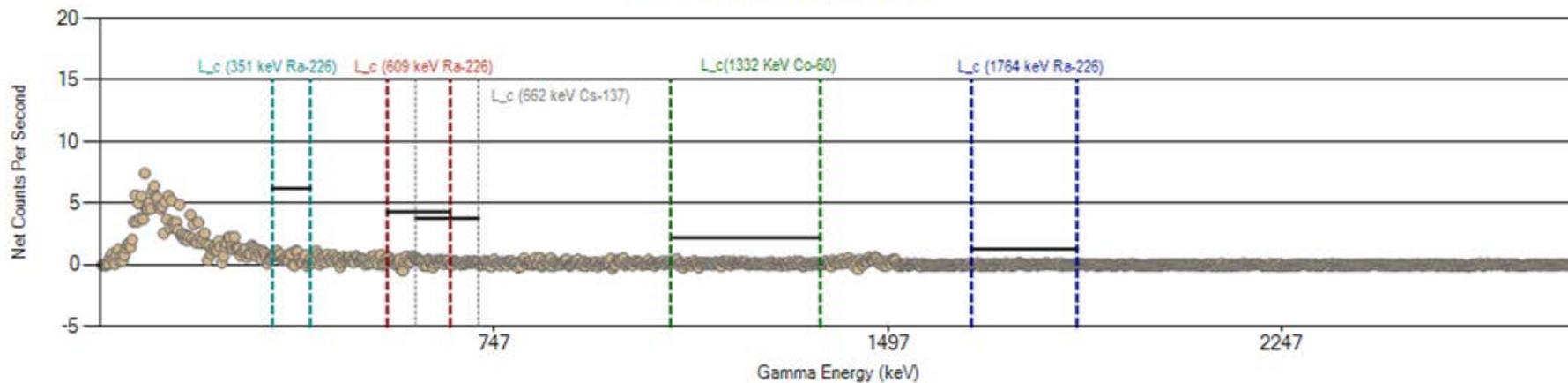


Gamma Spectra at Location 23

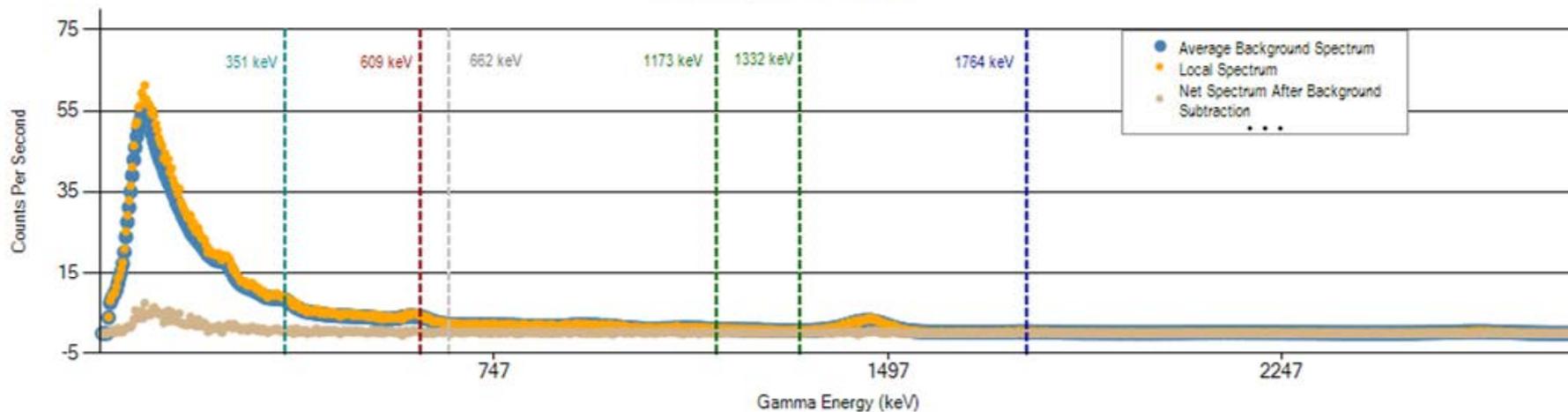


	ROI1	ROI2	ROI3	ROI4	ROI5	ROI6	ROI7	ROI8	ROI9	ROI10
Location 23 (cps)	835	112	19	21	147	137	108	173	91	3630
Static IL (cps)	1052	150	35	41	201	189	146	229	120	4255

Net Gamma Spectrum at Location 24

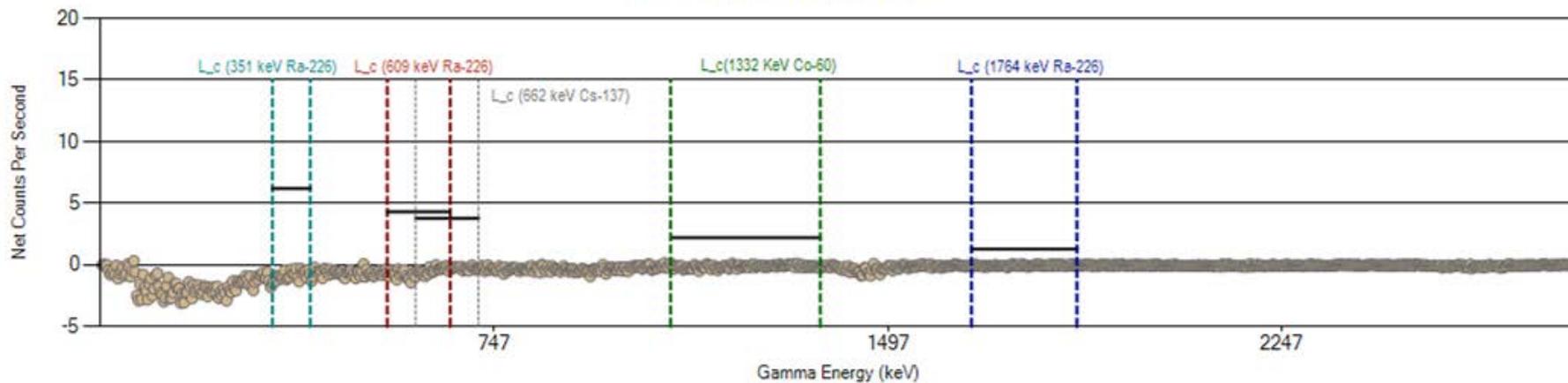


Gamma Spectra at Location 24

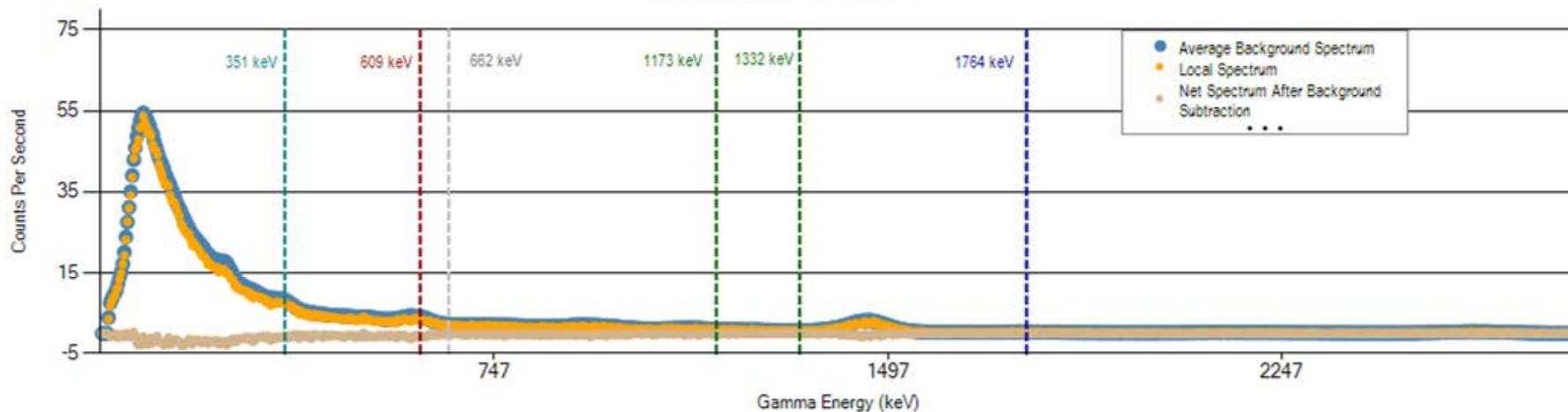


	ROI1	ROI2	ROI3	ROI4	ROI5	ROI6	ROI7	ROI8	ROI9	ROI10
Location 24 (cps)	930	126	22	24	166	151	116	188	99	3941
Static IL (cps)	1052	150	35	41	201	189	146	229	120	4255

Net Gamma Spectrum at Location 25

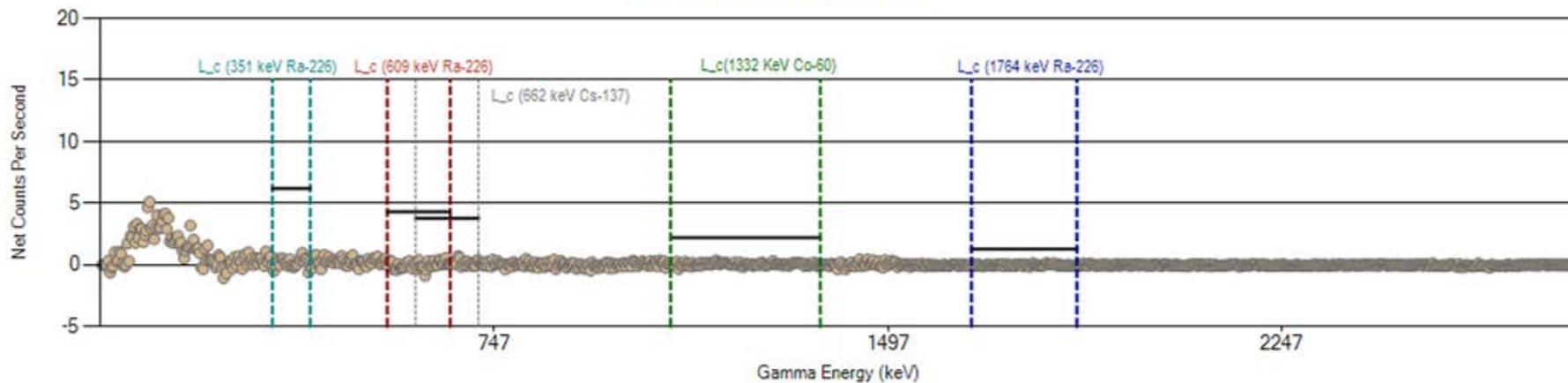


Gamma Spectra at Location 25

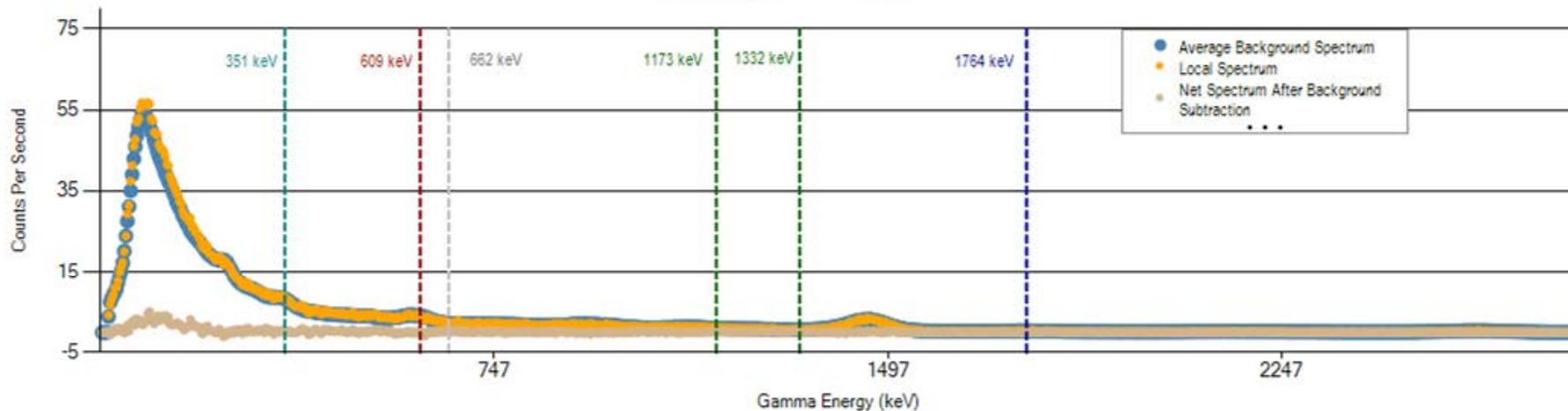


	ROI1	ROI2	ROI3	ROI4	ROI5	ROI6	ROI7	ROI8	ROI9	ROI10
Location 25 (cps)	713	98	17	18	126	117	93	153	76	3279
Static IL (cps)	1052	150	35	41	201	189	146	229	120	4255

Net Gamma Spectrum at Location 26

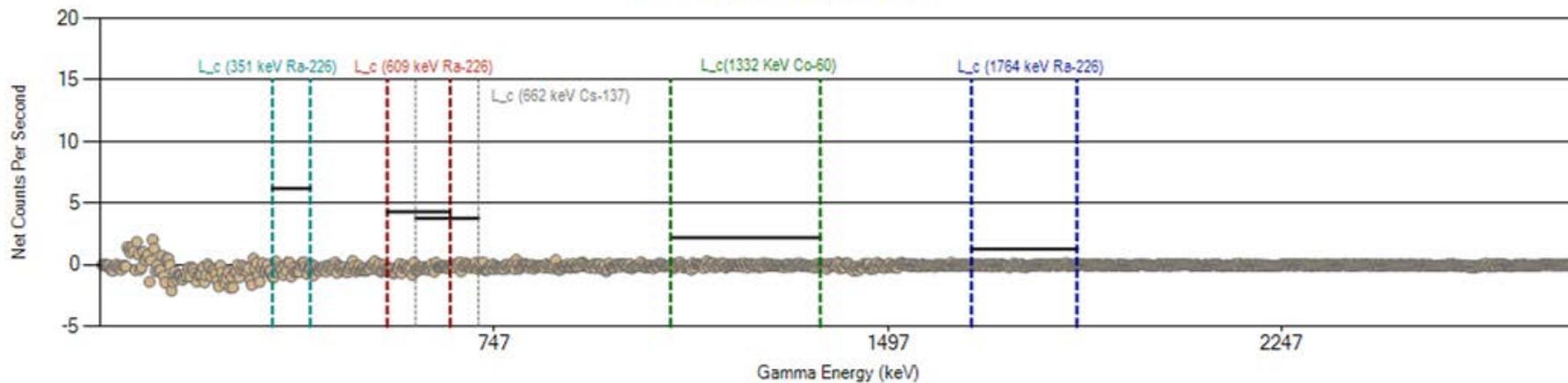


Gamma Spectra at Location 26

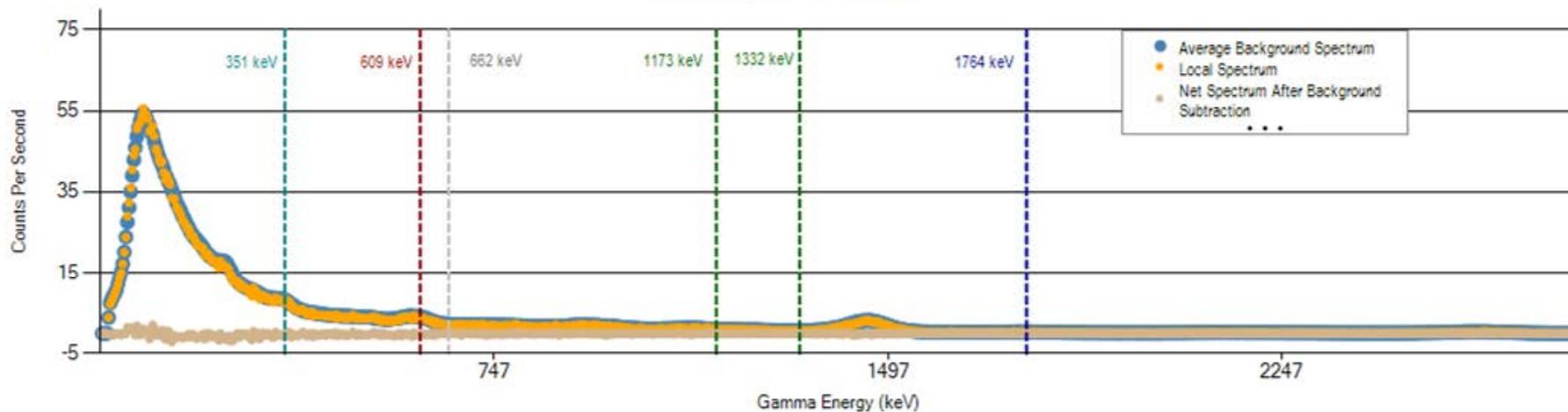


	ROI1	ROI2	ROI3	ROI4	ROI5	ROI6	ROI7	ROI8	ROI9	ROI10
Location 26 (cps)	878	118	20	21	158	140	111	179	95	3770
Static IL (cps)	1052	150	35	41	201	189	146	229	120	4255

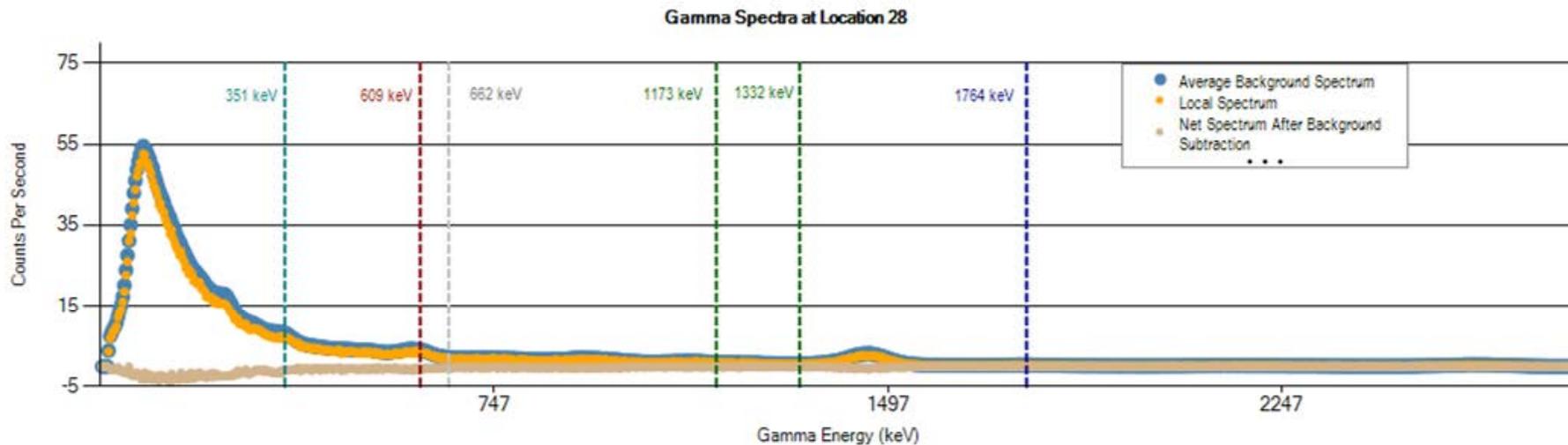
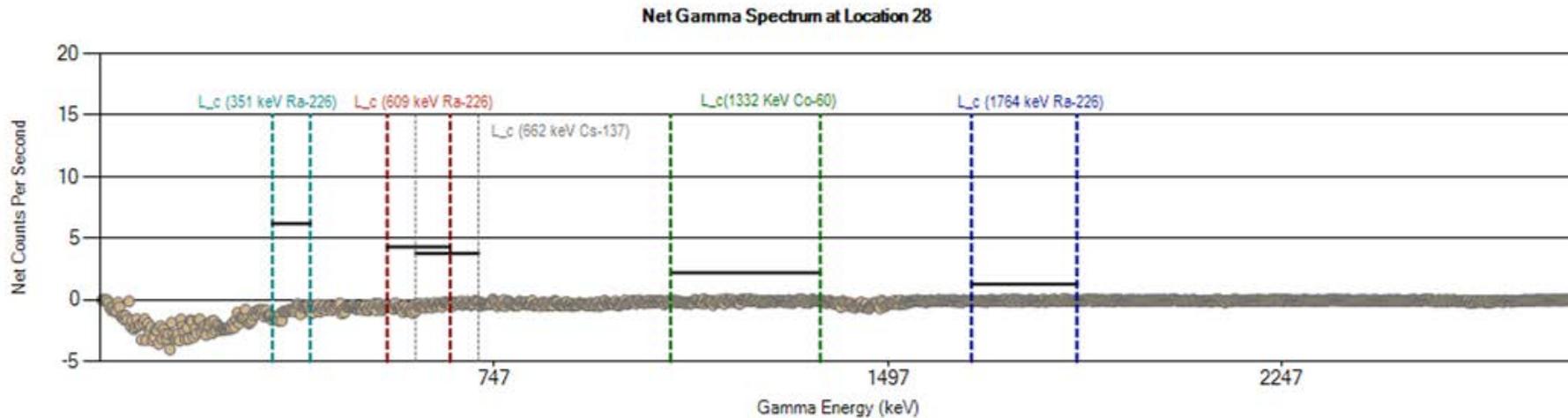
Net Gamma Spectrum at Location 27



Gamma Spectra at Location 27

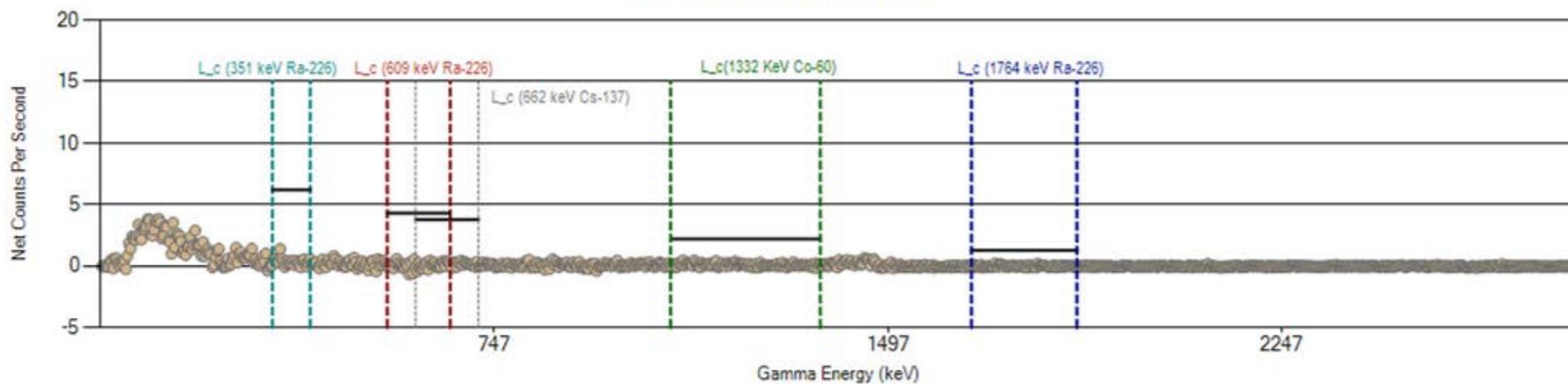


	ROI1	ROI2	ROI3	ROI4	ROI5	ROI6	ROI7	ROI8	ROI9	ROI10
Location 27 (cps)	803	110	19	20	140	129	101	167	85	3514
Static IL (cps)	1052	150	35	41	201	189	146	229	120	4255

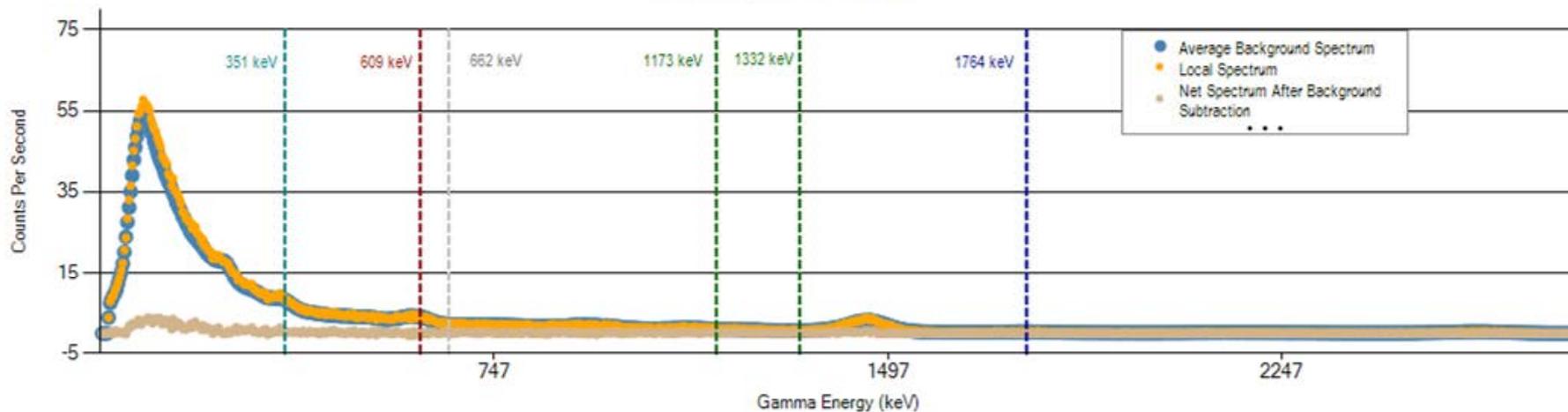


	ROI1	ROI2	ROI3	ROI4	ROI5	ROI6	ROI7	ROI8	ROI9	ROI10
Location 28 (cps)	722	97	17	18	127	119	93	151	78	3250
Static IL (cps)	1052	150	35	41	201	189	146	229	120	4255

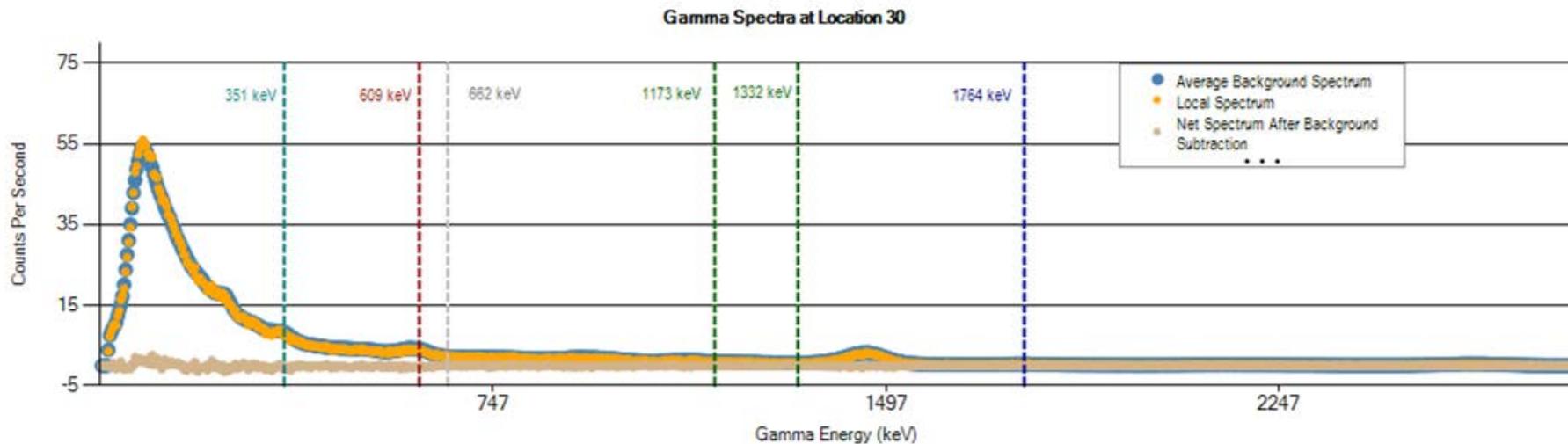
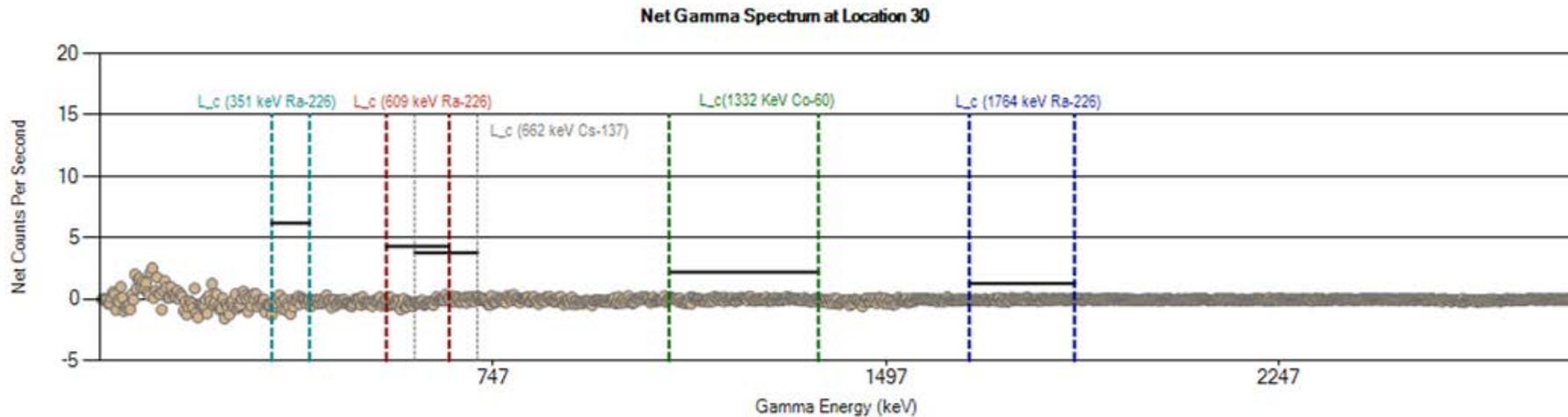
Net Gamma Spectrum at Location 29



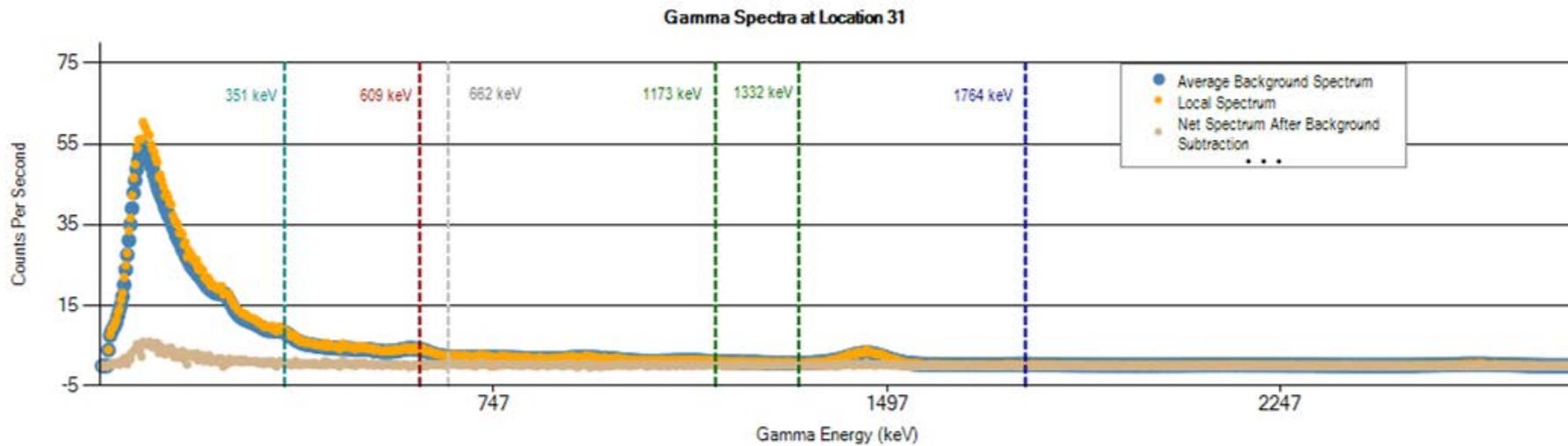
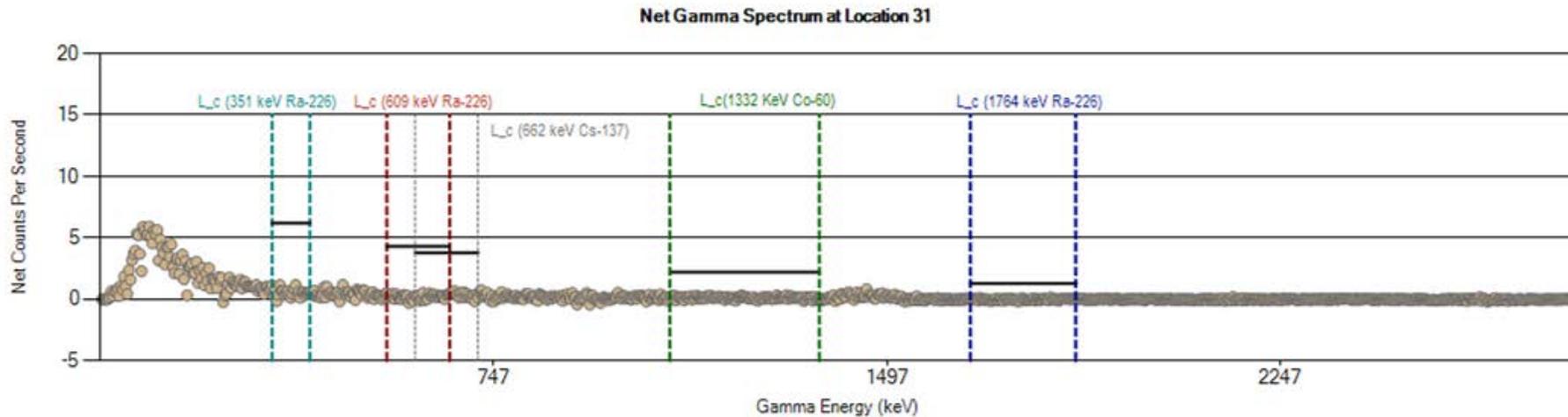
Gamma Spectra at Location 29



	ROI1	ROI2	ROI3	ROI4	ROI5	ROI6	ROI7	ROI8	ROI9	ROI10
Location 29 (cps)	897	124	21	23	157	143	113	183	99	3805
Static IL (cps)	1052	150	35	41	201	189	146	229	120	4255

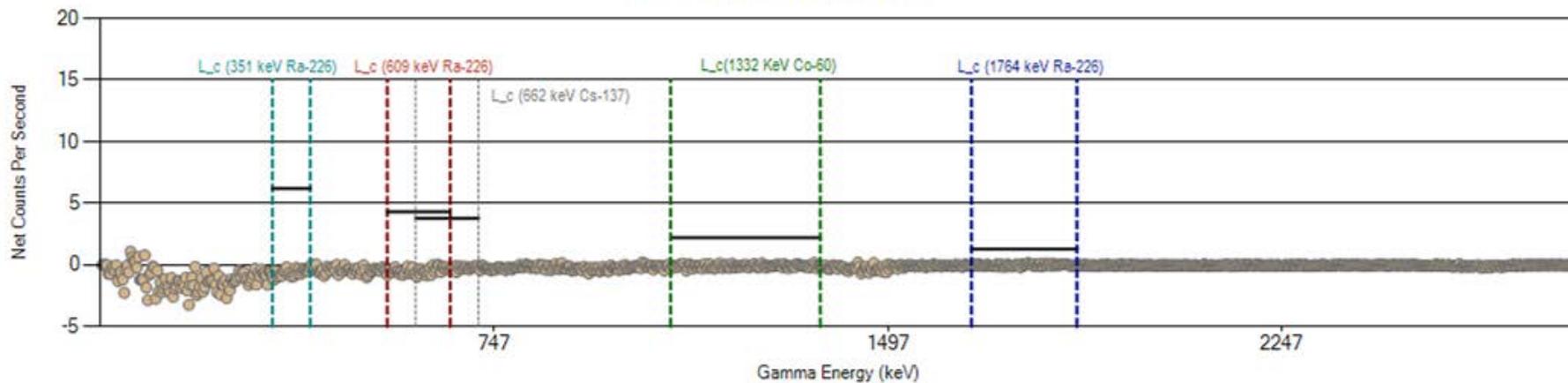


	ROI1	ROI2	ROI3	ROI4	ROI5	ROI6	ROI7	ROI8	ROI9	ROI10
Location 30 (cps)	806	106	19	19	142	131	105	168	87	3557
Static IL (cps)	1052	150	35	41	201	189	146	229	120	4255

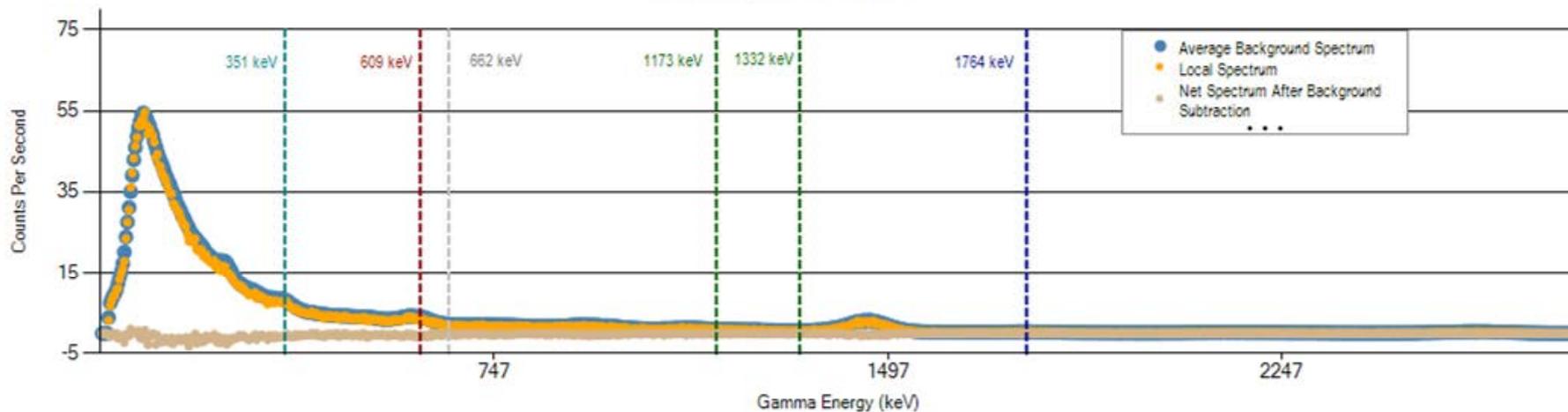


	ROI1	ROI2	ROI3	ROI4	ROI5	ROI6	ROI7	ROI8	ROI9	ROI10
Location 31 (cps)	927	127	20	22	166	149	119	187	100	3926
Static IL (cps)	1052	150	35	41	201	189	146	229	120	4255

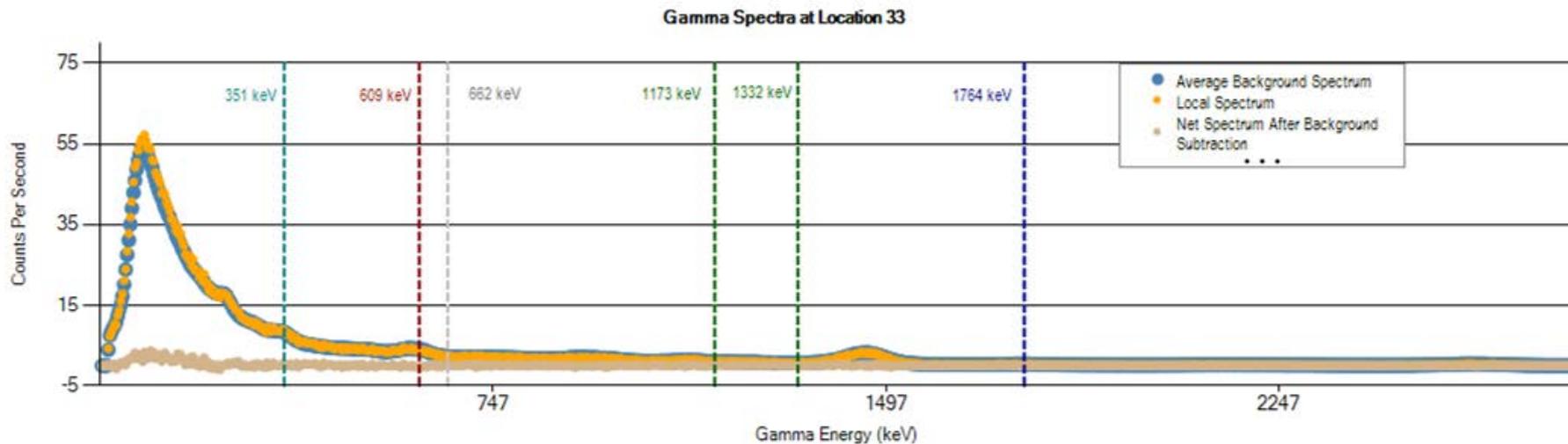
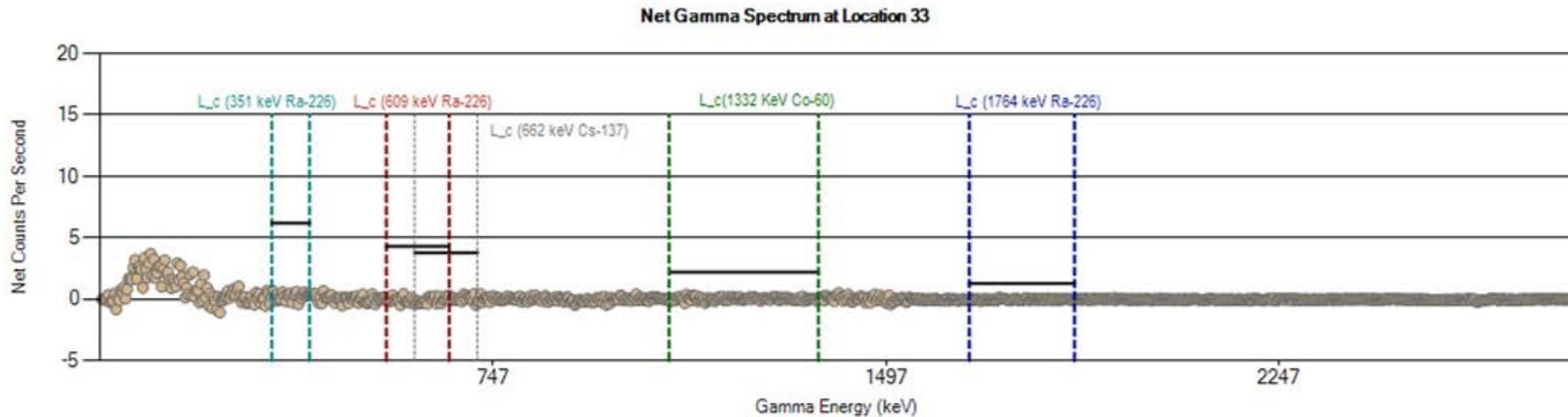
Net Gamma Spectrum at Location 32



Gamma Spectra at Location 32

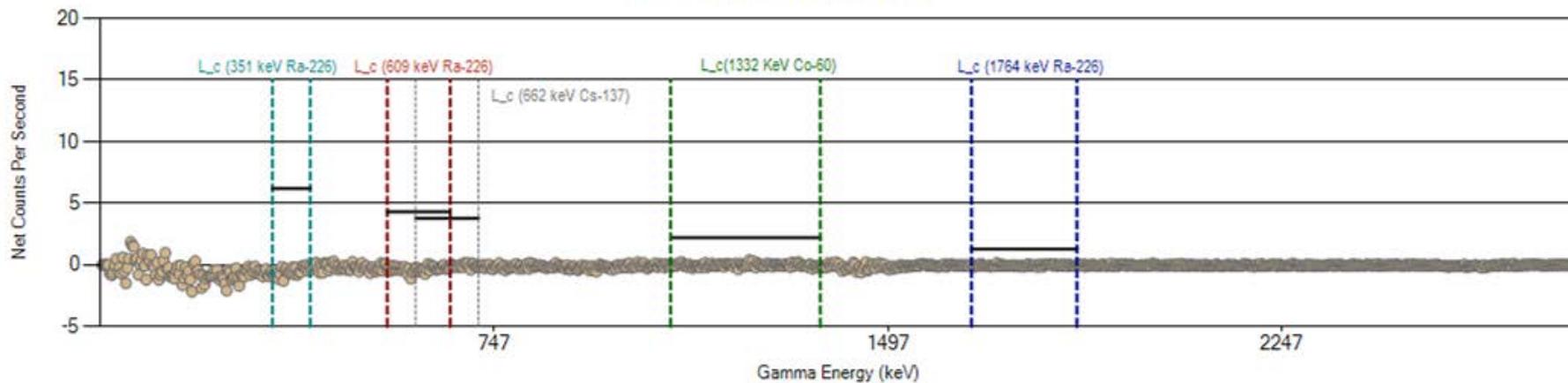


	ROI1	ROI2	ROI3	ROI4	ROI5	ROI6	ROI7	ROI8	ROI9	ROI10
Location 32 (cps)	750	102	19	19	134	122	94	159	80	3372
Static IL (cps)	1052	150	35	41	201	189	146	229	120	4255

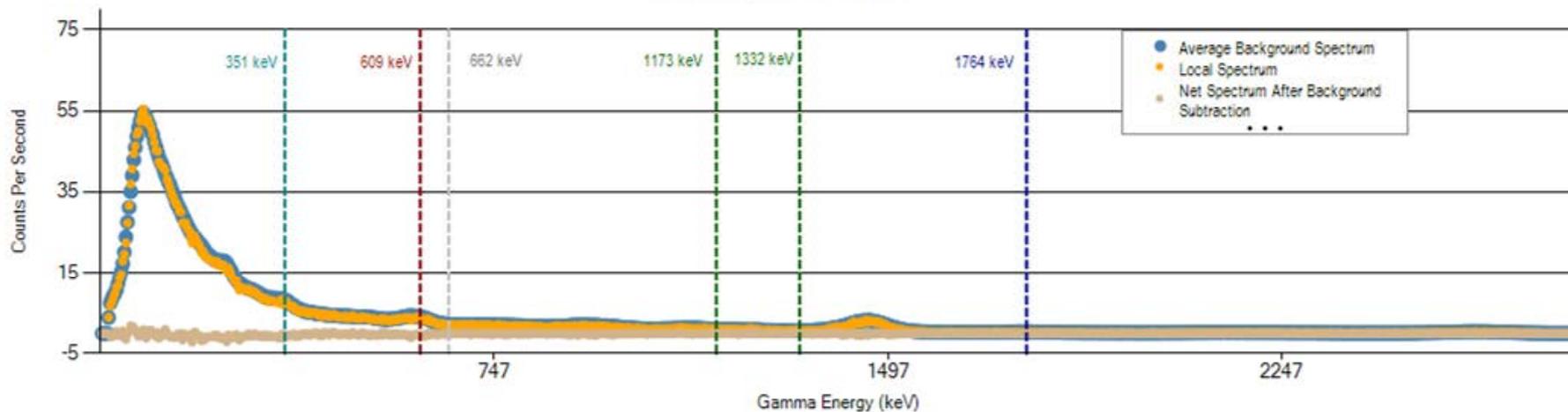


	ROI1	ROI2	ROI3	ROI4	ROI5	ROI6	ROI7	ROI8	ROI9	ROI10
Location 33 (cps)	856	118	20	21	151	138	107	181	92	3715
Static IL (cps)	1052	150	35	41	201	189	146	229	120	4255

Net Gamma Spectrum at Location 34

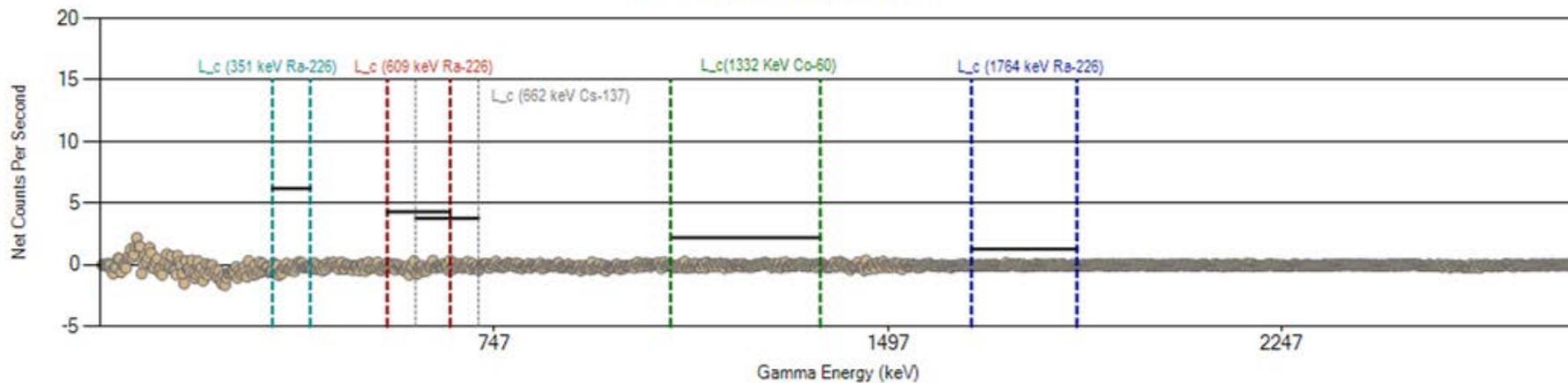


Gamma Spectra at Location 34

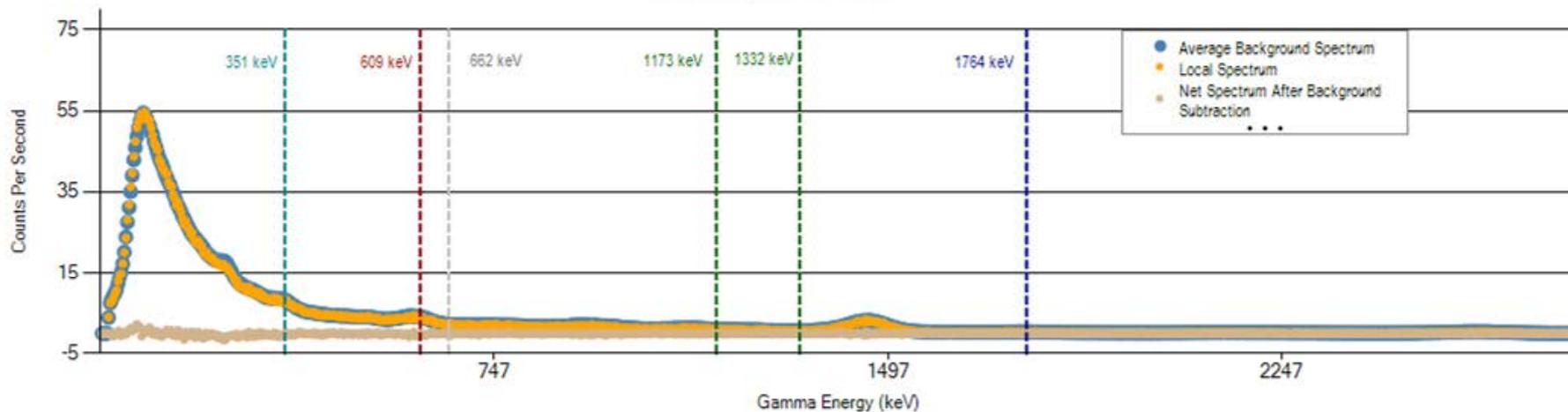


	ROI1	ROI2	ROI3	ROI4	ROI5	ROI6	ROI7	ROI8	ROI9	ROI10
Location 34 (cps)	794	107	18	20	142	128	100	162	86	3487
Static IL (cps)	1052	150	35	41	201	189	146	229	120	4255

Net Gamma Spectrum at Location 35

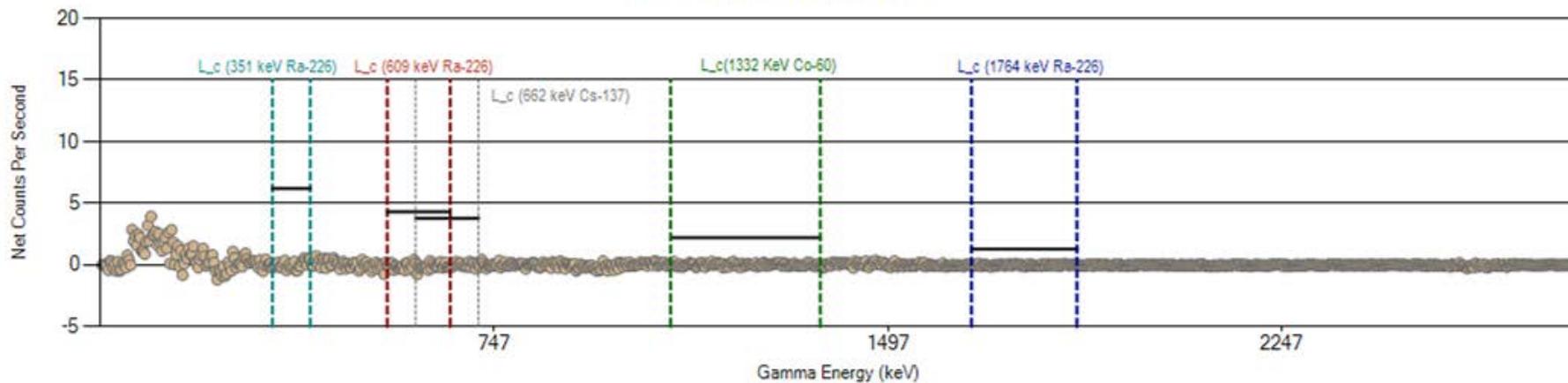


Gamma Spectra at Location 35

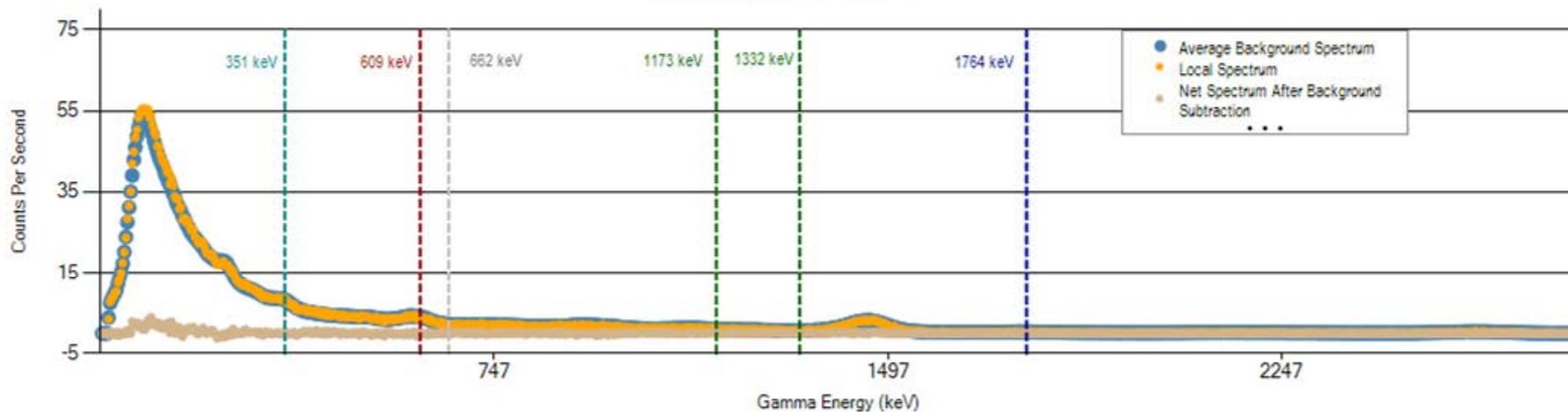


	ROI1	ROI2	ROI3	ROI4	ROI5	ROI6	ROI7	ROI8	ROI9	ROI10
Location 35 (cps)	812	111	19	19	146	133	102	169	86	3545
Static IL (cps)	1052	150	35	41	201	189	146	229	120	4255

Net Gamma Spectrum at Location 36

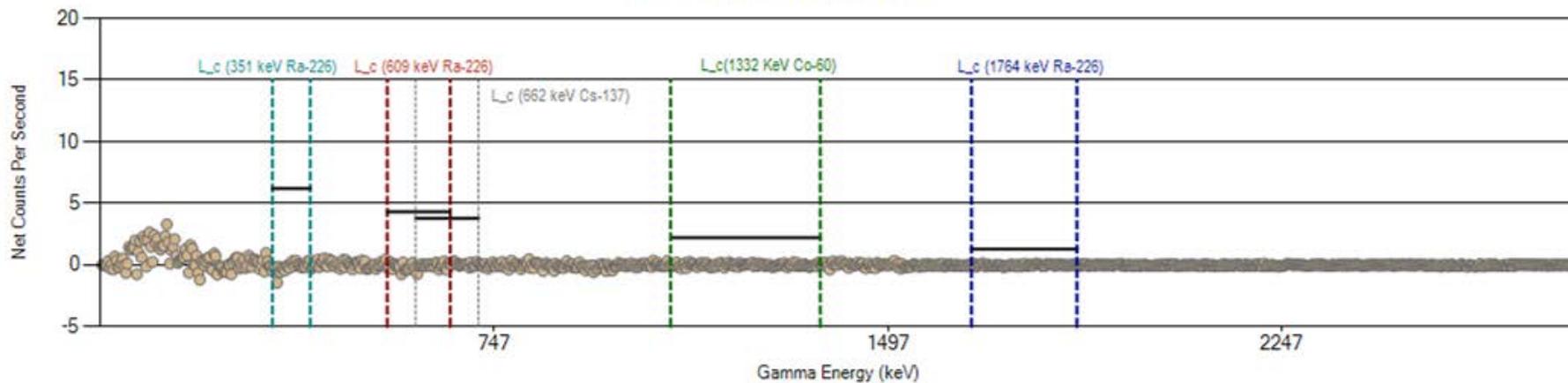


Gamma Spectra at Location 36

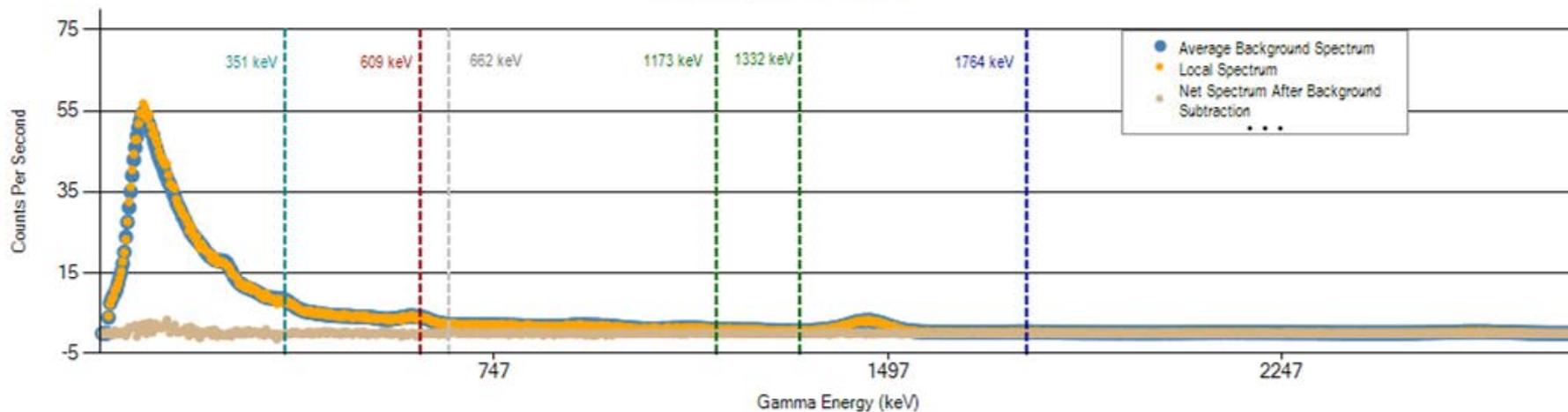


	ROI1	ROI2	ROI3	ROI4	ROI5	ROI6	ROI7	ROI8	ROI9	ROI10
Location 36 (cps)	849	118	20	21	149	136	105	176	91	3676
Static IL (cps)	1052	150	35	41	201	189	146	229	120	4255

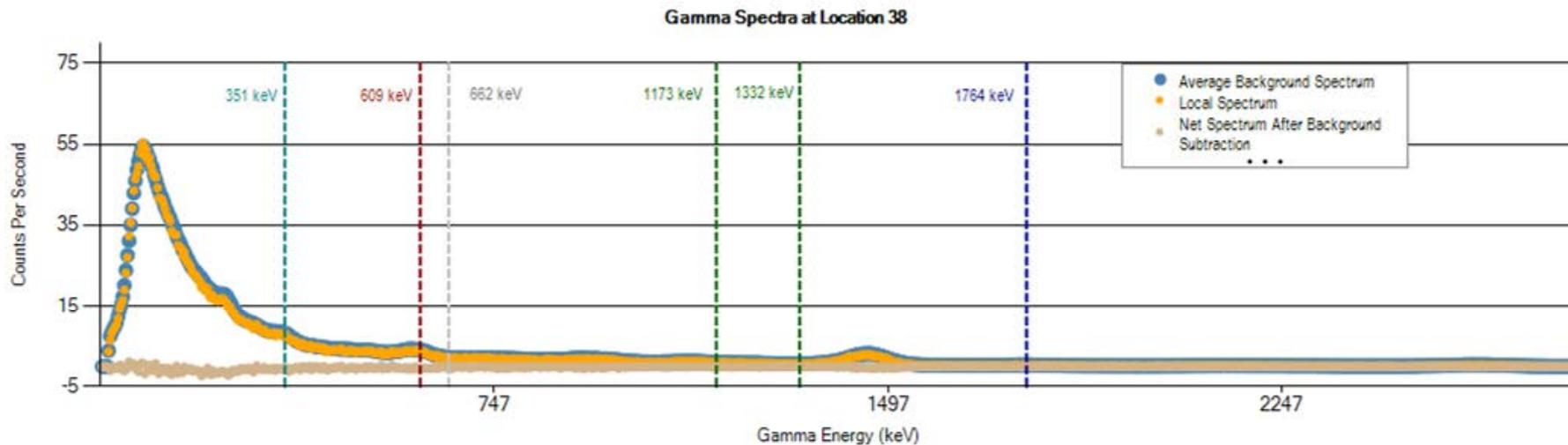
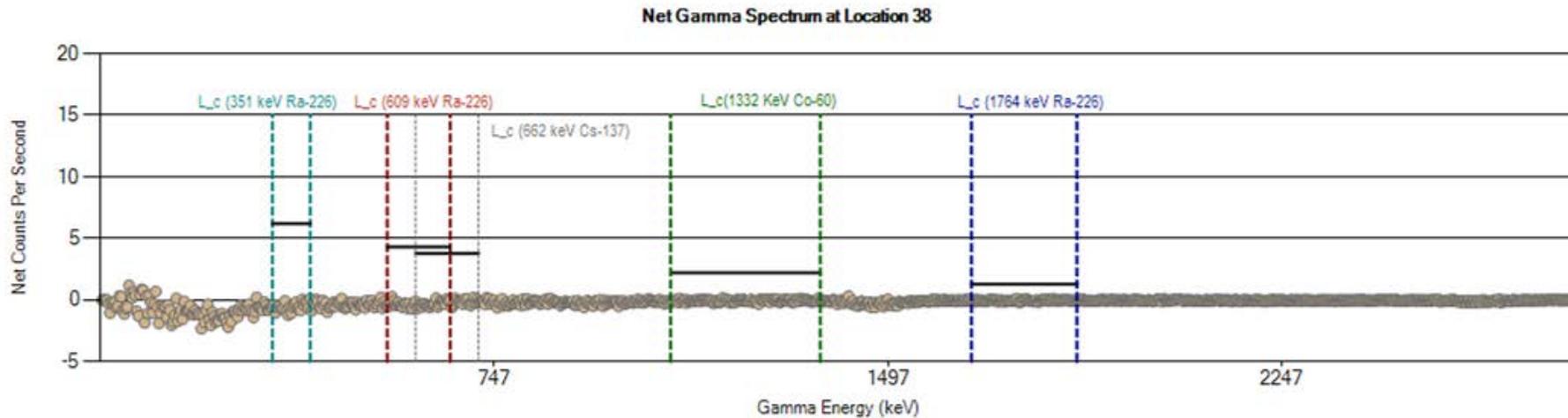
Net Gamma Spectrum at Location 37



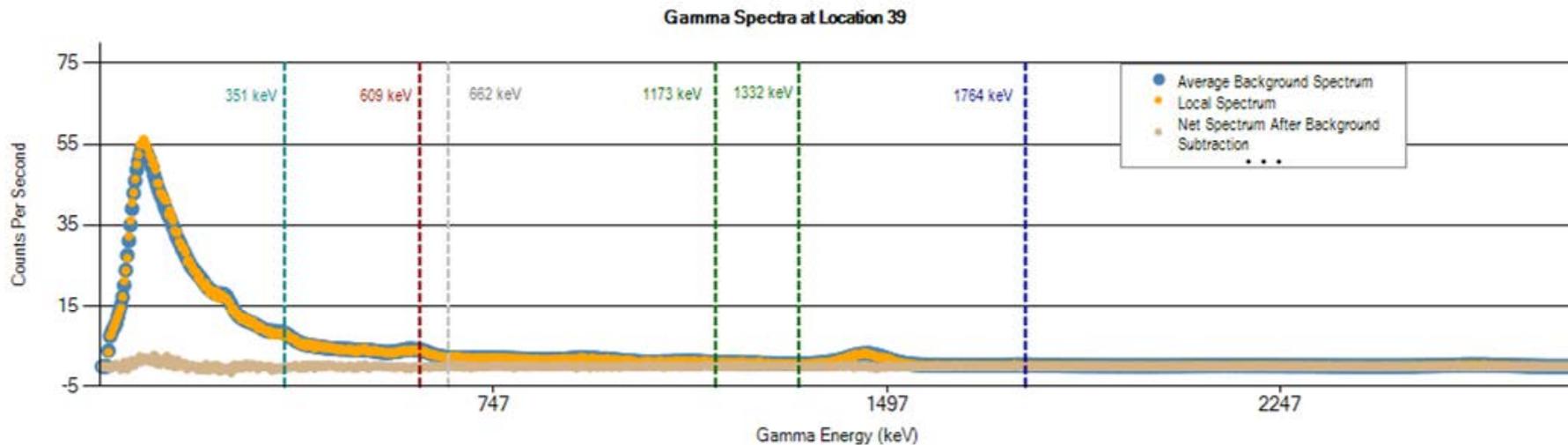
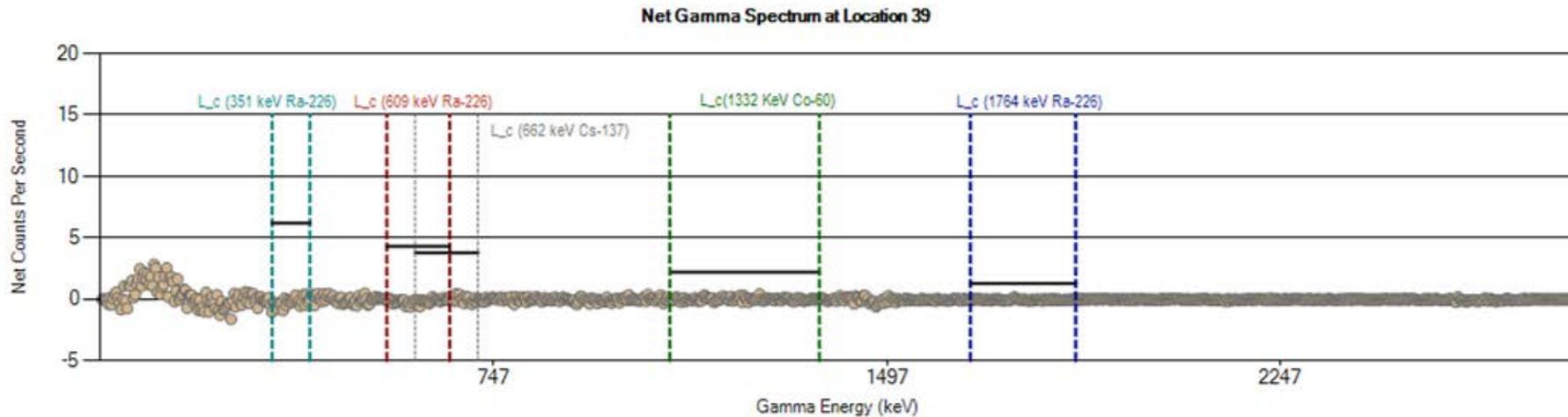
Gamma Spectra at Location 37



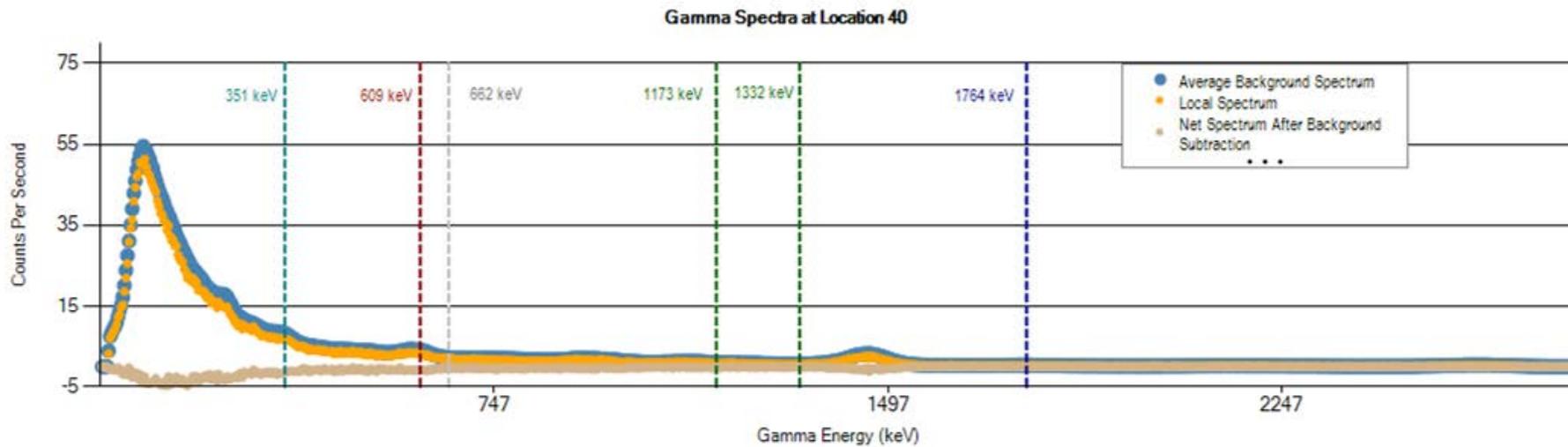
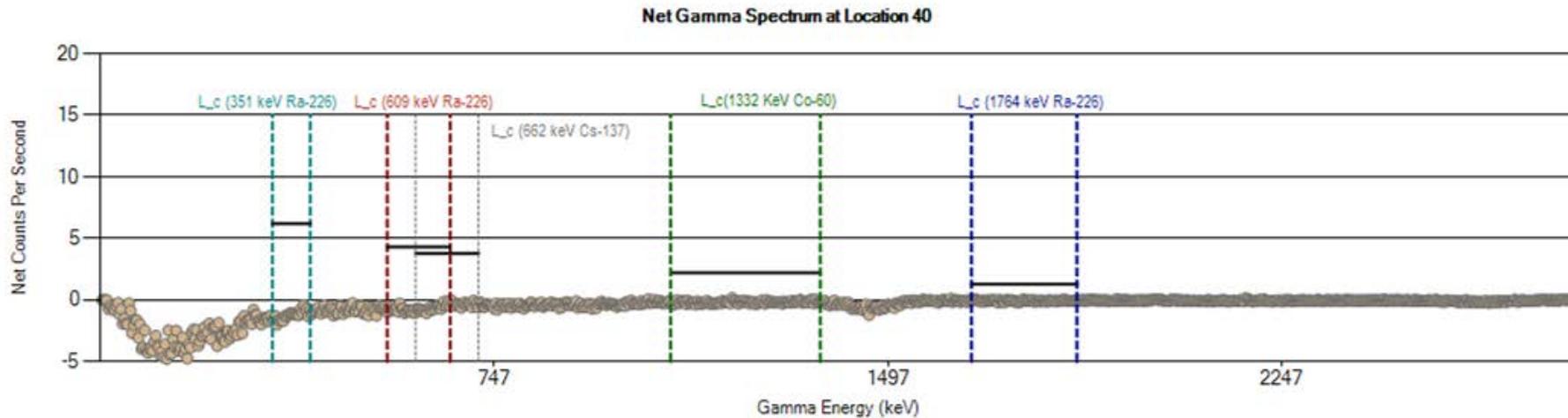
	ROI1	ROI2	ROI3	ROI4	ROI5	ROI6	ROI7	ROI8	ROI9	ROI10
Location 37 (cps)	841	115	19	22	151	137	107	171	88	3649
Static IL (cps)	1052	150	35	41	201	189	146	229	120	4255



	ROI1	ROI2	ROI3	ROI4	ROI5	ROI6	ROI7	ROI8	ROI9	ROI10
Location 38 (cps)	769	102	18	19	138	127	98	161	84	3431
Static IL (cps)	1052	150	35	41	201	189	146	229	120	4255

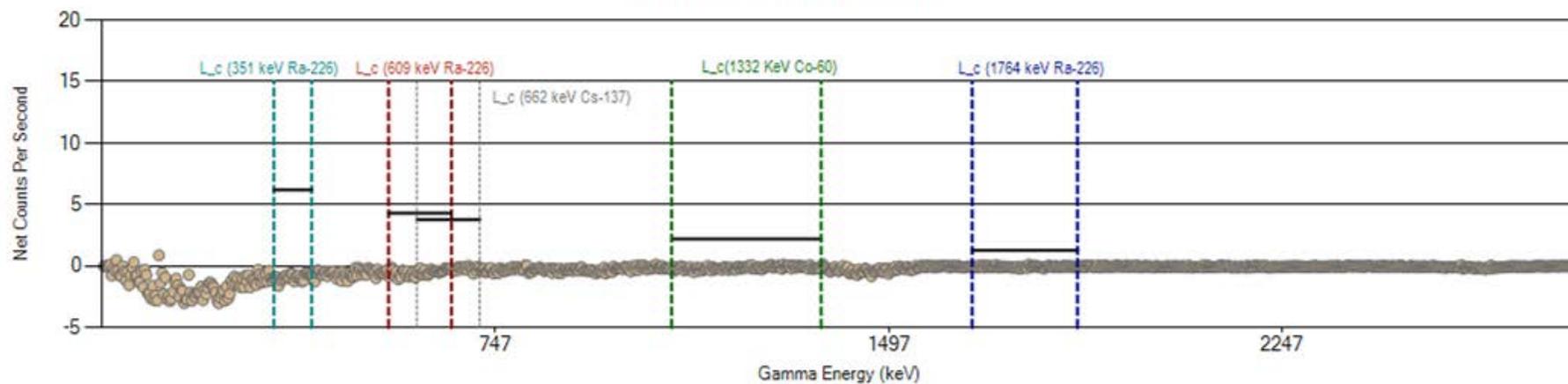


	ROI1	ROI2	ROI3	ROI4	ROI5	ROI6	ROI7	ROI8	ROI9	ROI10
Location 39 (cps)	836	112	18	20	149	135	105	170	90	3621
Static IL (cps)	1052	150	35	41	201	189	146	229	120	4255

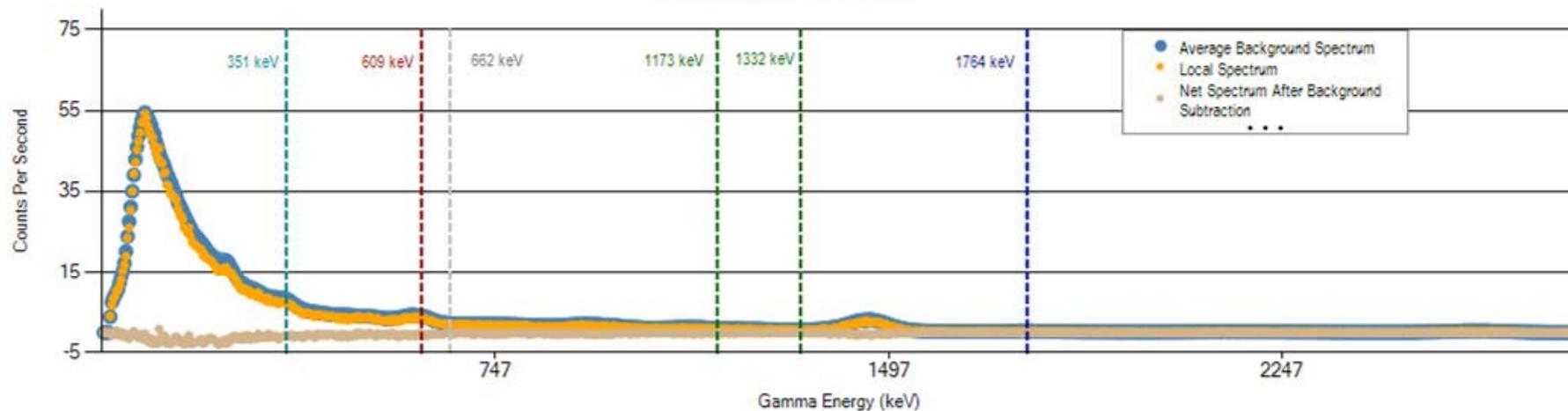


	ROI1	ROI2	ROI3	ROI4	ROI5	ROI6	ROI7	ROI8	ROI9	ROI10
Location 40 (cps)	681	89	17	16	122	112	88	144	72	3138
Static IL (cps)	1052	150	35	41	201	189	146	229	120	4255

Net Gamma Spectrum at Location 41

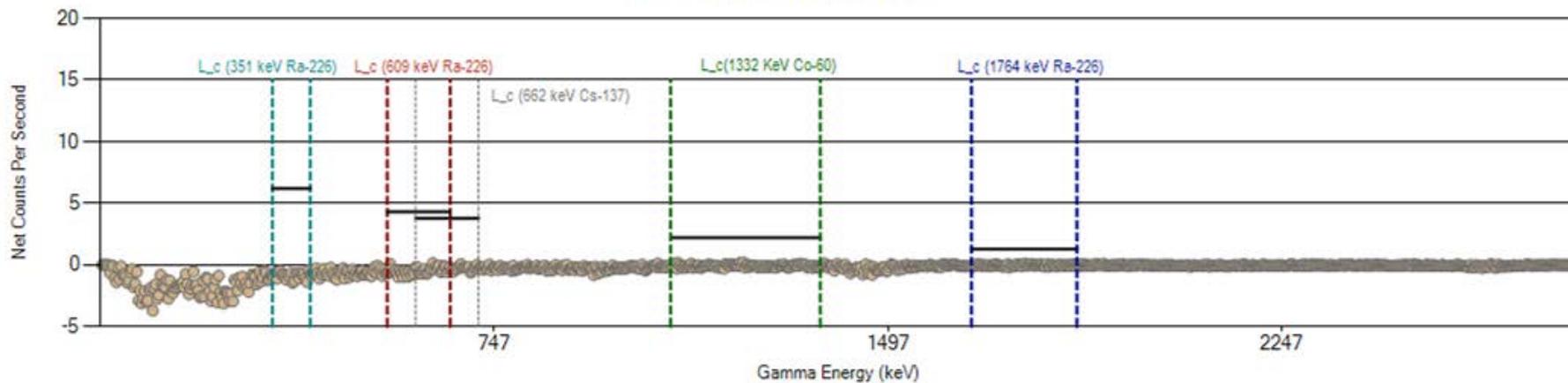


Gamma Spectra at Location 41

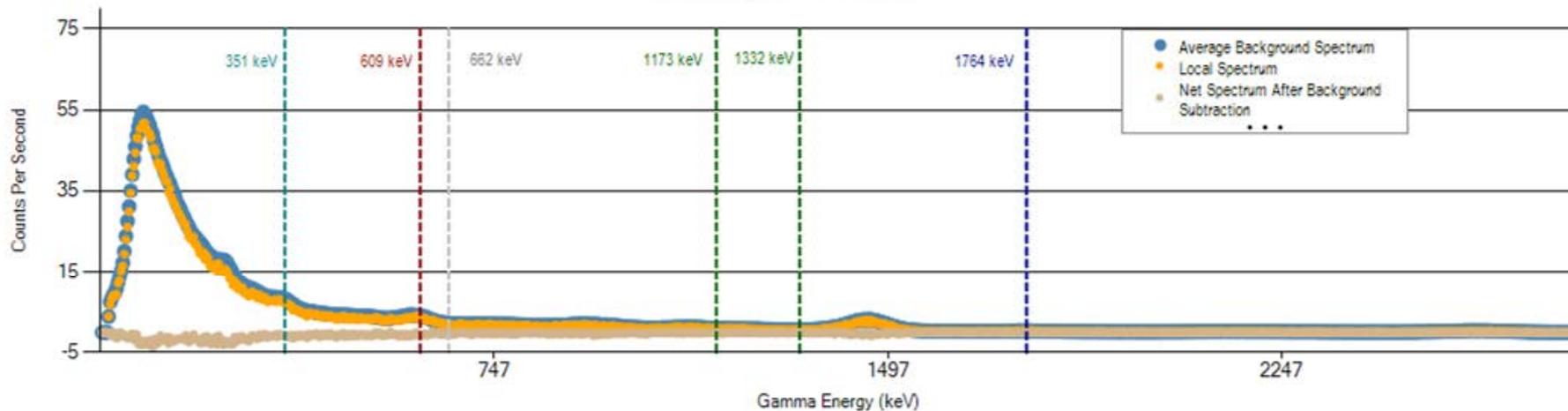


	ROI1	ROI2	ROI3	ROI4	ROI5	ROI6	ROI7	ROI8	ROI9	ROI10
Location 41 (cps)	728	97	17	18	130	120	94	152	76	3306
Static IL (cps)	1052	150	35	41	201	189	146	229	120	4255

Net Gamma Spectrum at Location 42

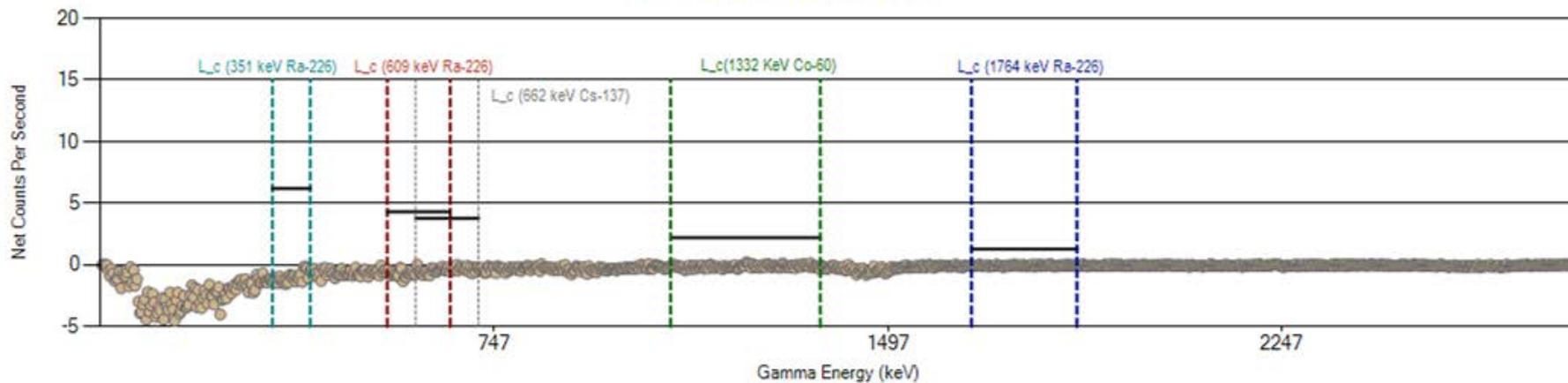


Gamma Spectra at Location 42

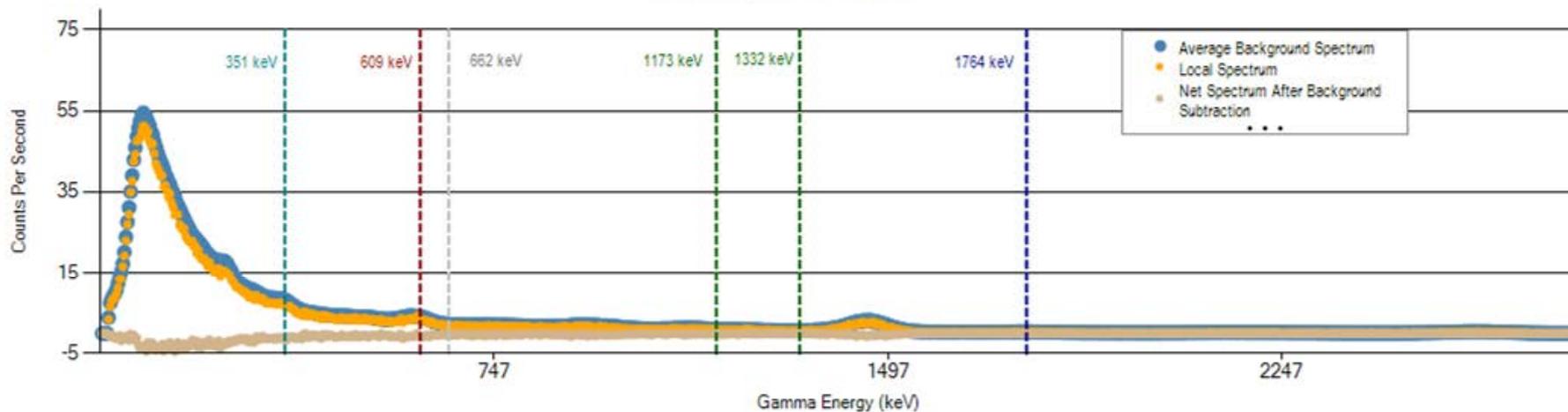


	ROI1	ROI2	ROI3	ROI4	ROI5	ROI6	ROI7	ROI8	ROI9	ROI10
Location 42 (cps)	734	100	18	18	129	121	94	153	80	3297
Static IL (cps)	1052	150	35	41	201	189	146	229	120	4255

Net Gamma Spectrum at Location 43

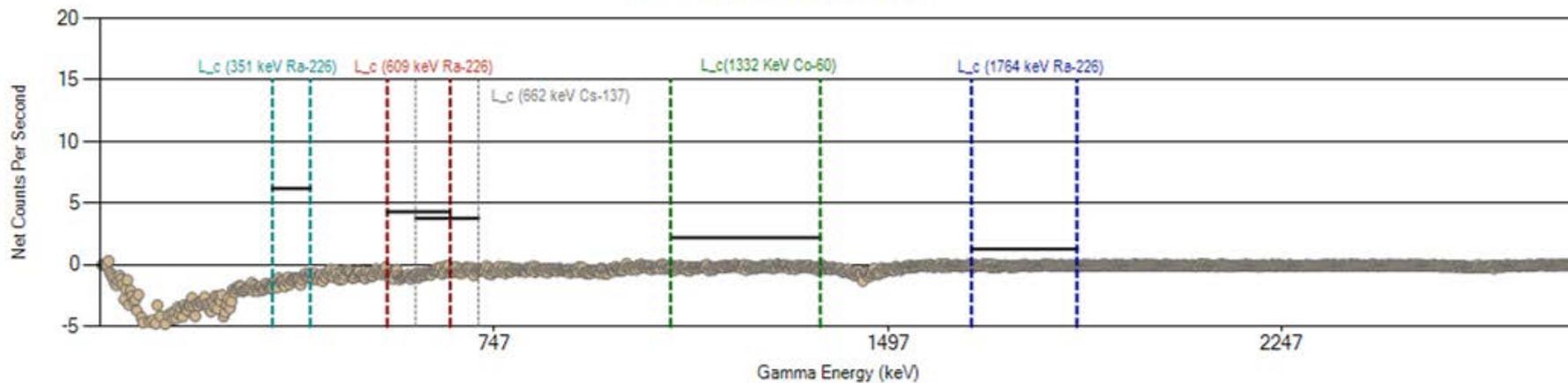


Gamma Spectra at Location 43

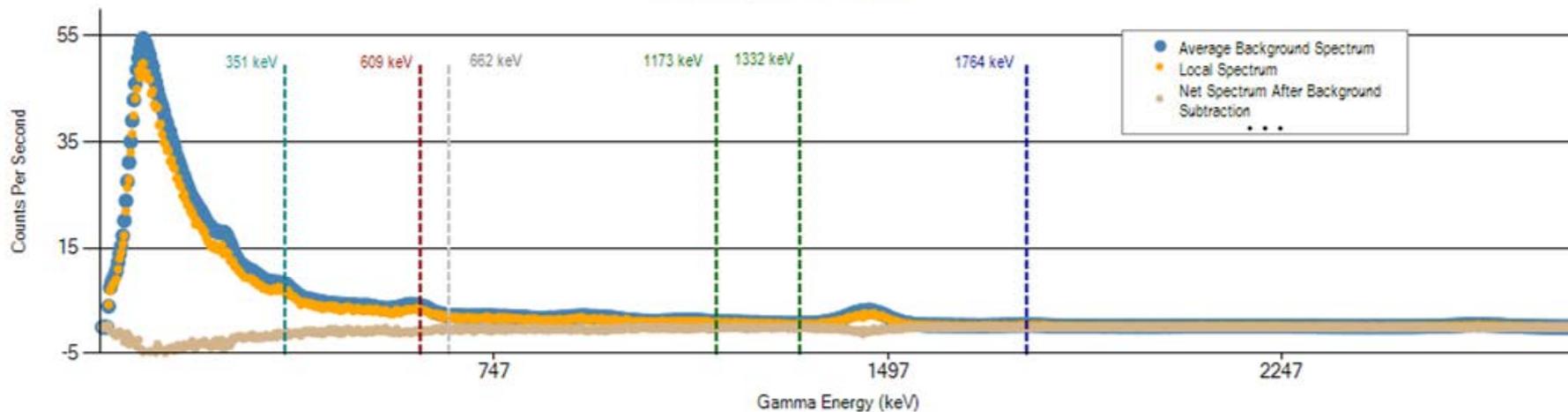


	ROI1	ROI2	ROI3	ROI4	ROI5	ROI6	ROI7	ROI8	ROI9	ROI10
Location 43 (cps)	711	95	17	18	128	117	91	150	77	3208
Static IL (cps)	1052	150	35	41	201	189	146	229	120	4255

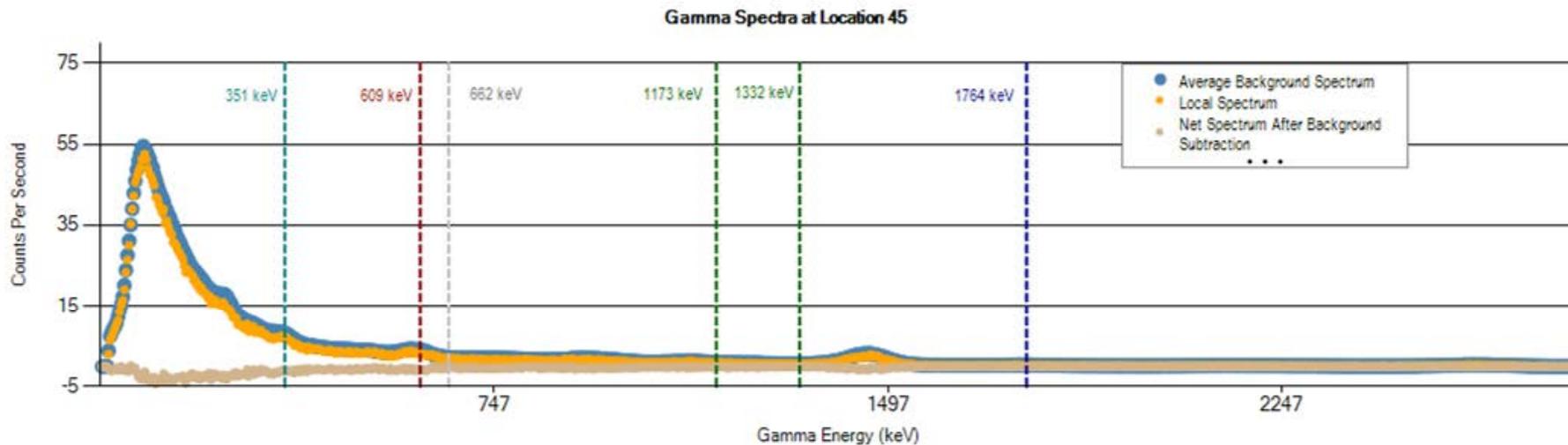
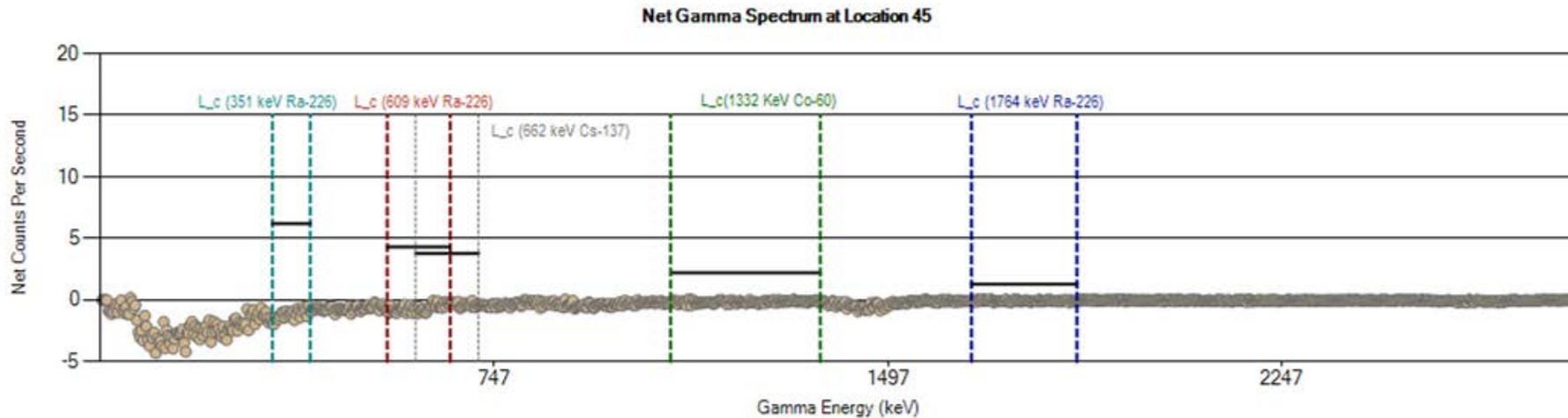
Net Gamma Spectrum at Location 44



Gamma Spectra at Location 44

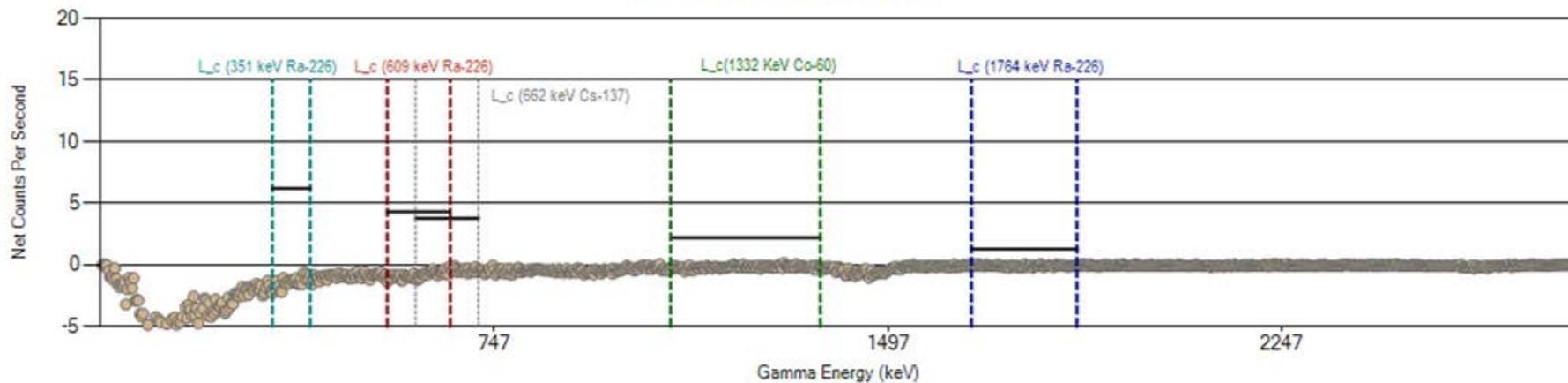


	ROI1	ROI2	ROI3	ROI4	ROI5	ROI6	ROI7	ROI8	ROI9	ROI10
Location 44 (cps)	672	88	16	16	122	111	87	144	71	3081
Static IL (cps)	1052	150	35	41	201	189	146	229	120	4255

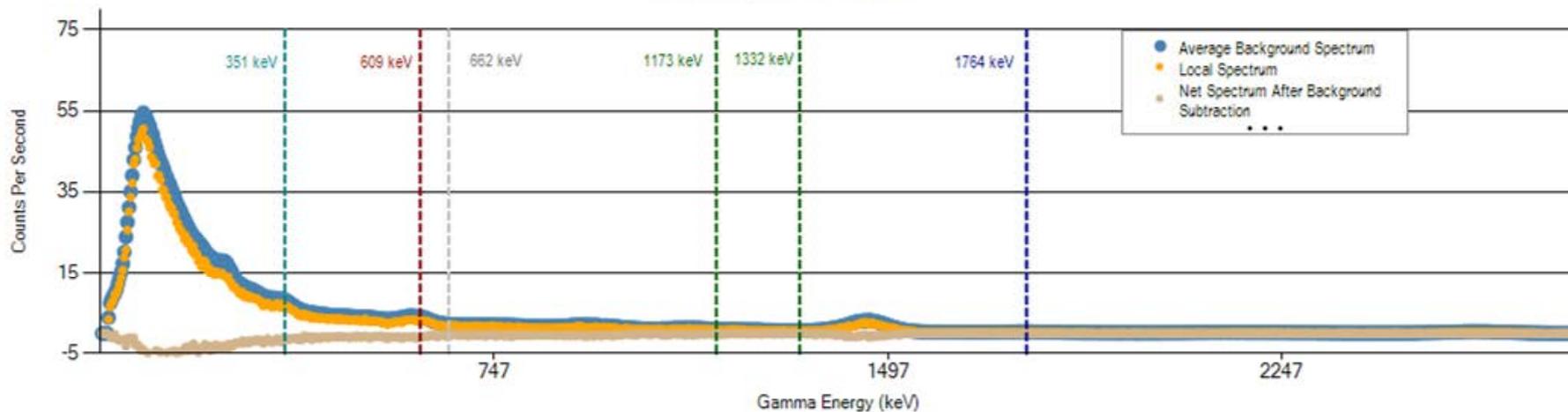


	ROI1	ROI2	ROI3	ROI4	ROI5	ROI6	ROI7	ROI8	ROI9	ROI10
Location 45 (cps)	697	92	16	18	124	114	88	146	74	3206
Static IL (cps)	1052	150	35	41	201	189	146	229	120	4255

Net Gamma Spectrum at Location 46

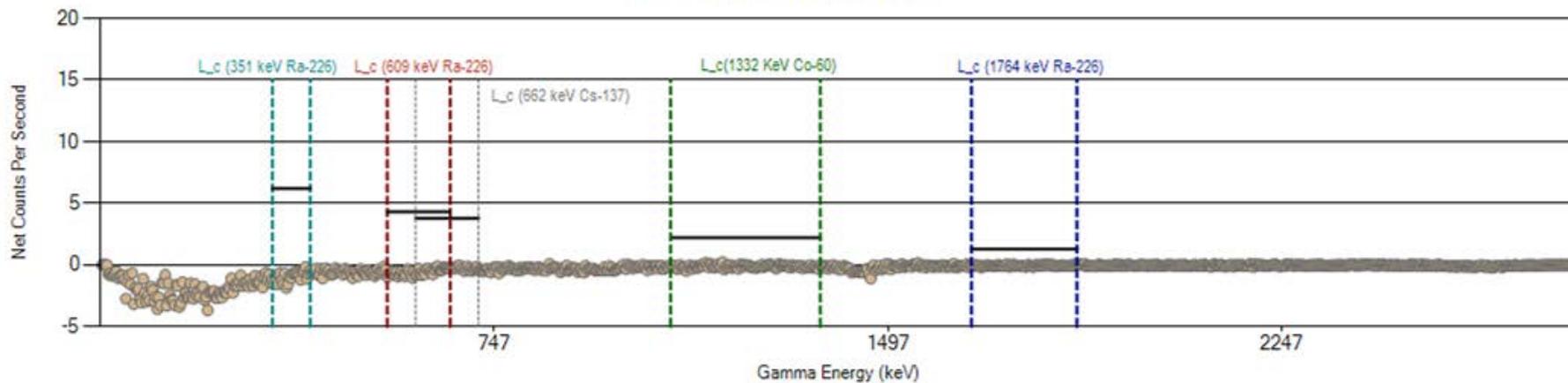


Gamma Spectra at Location 46

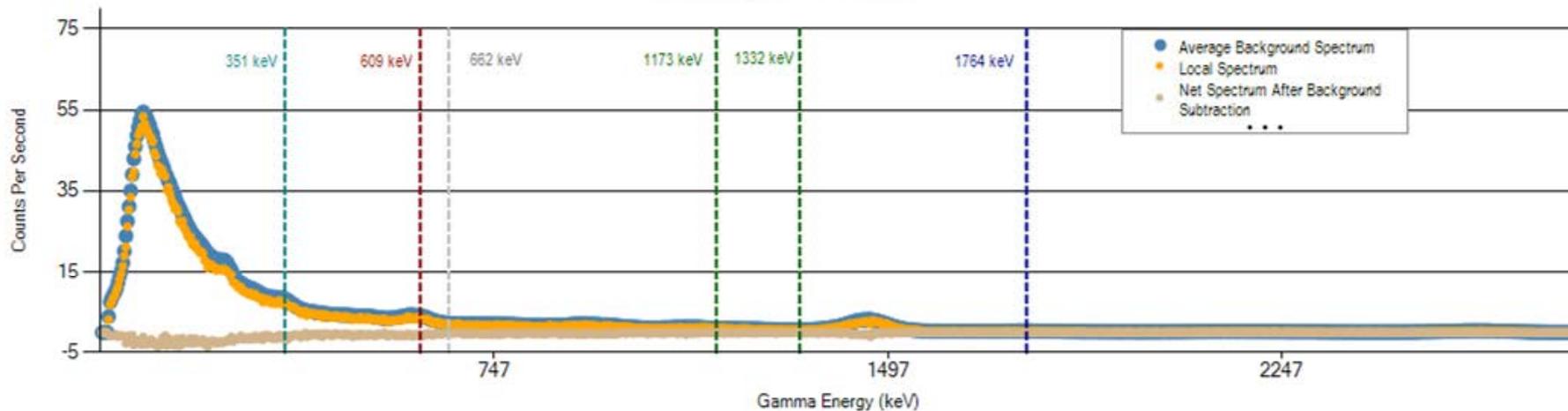


	ROI1	ROI2	ROI3	ROI4	ROI5	ROI6	ROI7	ROI8	ROI9	ROI10
Location 46 (cps)	658	88	15	16	117	108	85	140	72	3039
Static IL (cps)	1052	150	35	41	201	189	146	229	120	4255

Net Gamma Spectrum at Location 47

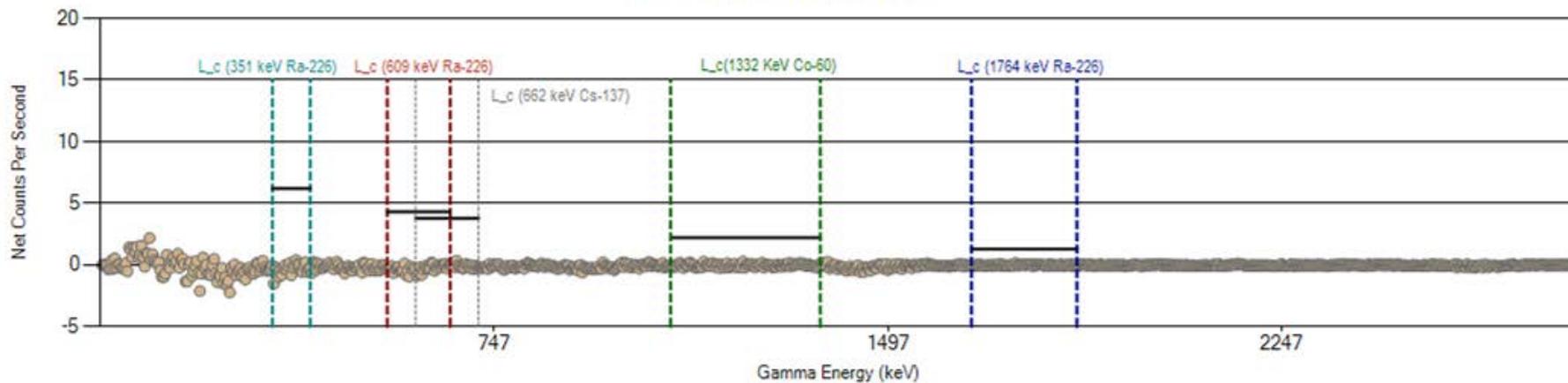


Gamma Spectra at Location 47

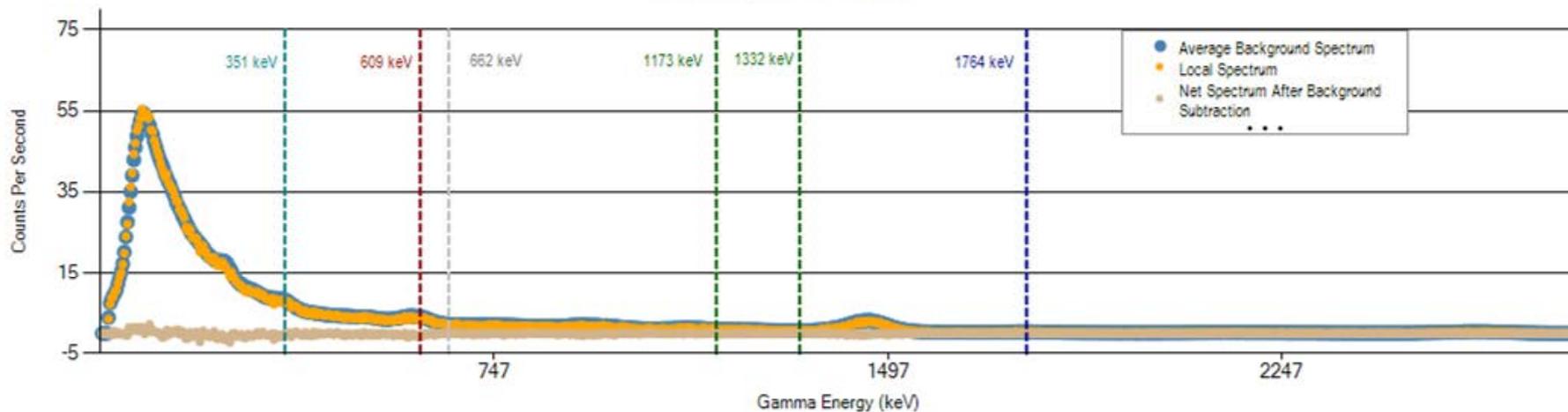


	ROI1	ROI2	ROI3	ROI4	ROI5	ROI6	ROI7	ROI8	ROI9	ROI10
Location 47 (cps)	722	100	17	18	127	118	93	151	77	3256
Static IL (cps)	1052	150	35	41	201	189	146	229	120	4255

Net Gamma Spectrum at Location 48



Gamma Spectra at Location 48

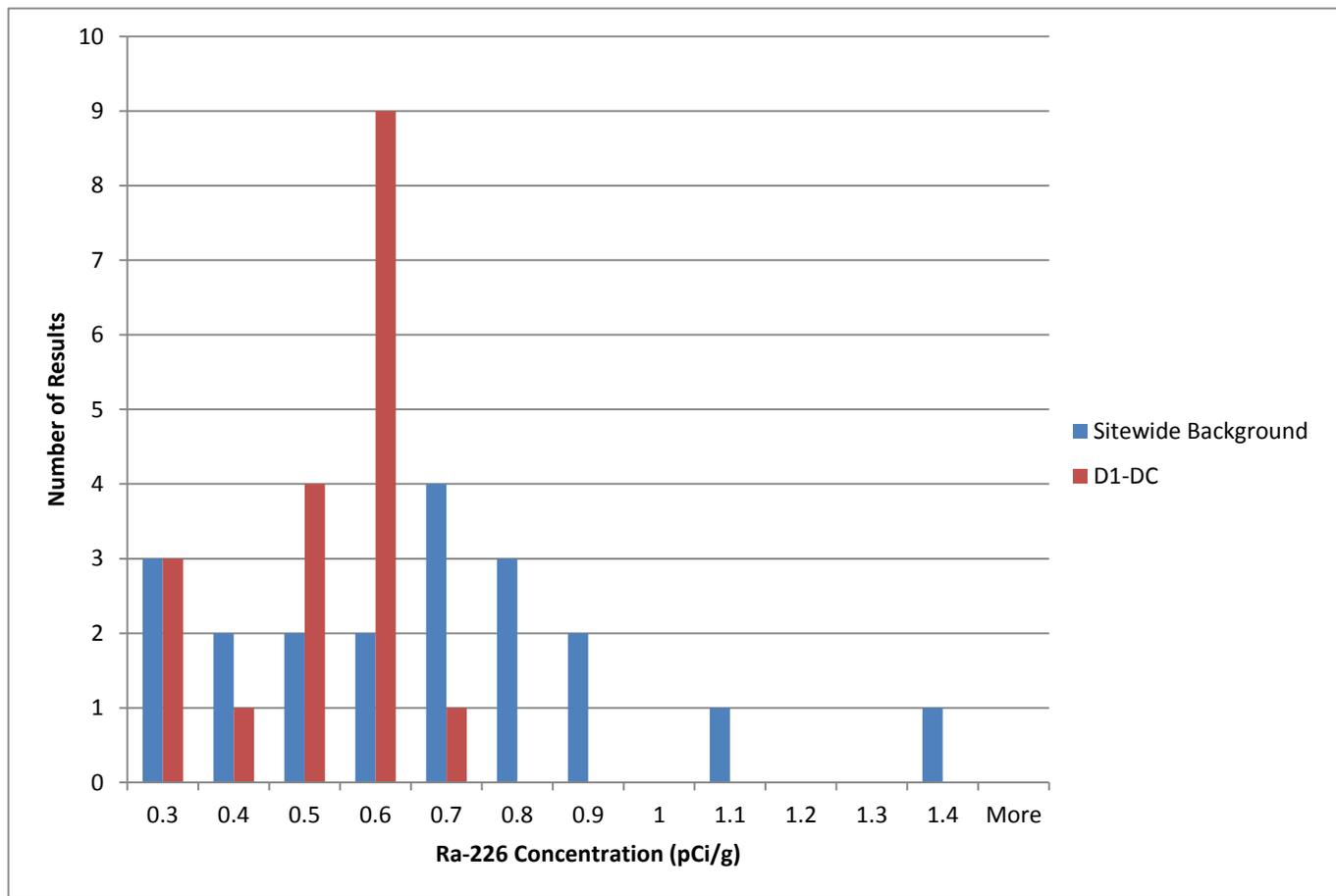


	ROI1	ROI2	ROI3	ROI4	ROI5	ROI6	ROI7	ROI8	ROI9	ROI10
Location 48 (cps)	795	105	19	19	141	129	101	166	86	3529
Static IL (cps)	1052	150	35	41	201	189	146	229	120	4255

Histogram, RSY D1 (DC) vs. Sitewide Background

Background	
<i>Bin</i>	<i>Frequency</i>
0.3	3
0.4	2
0.5	2
0.6	2
0.7	4
0.8	3
0.9	2
1	0
1.1	1
1.2	0
1.3	0
1.4	1
More	0

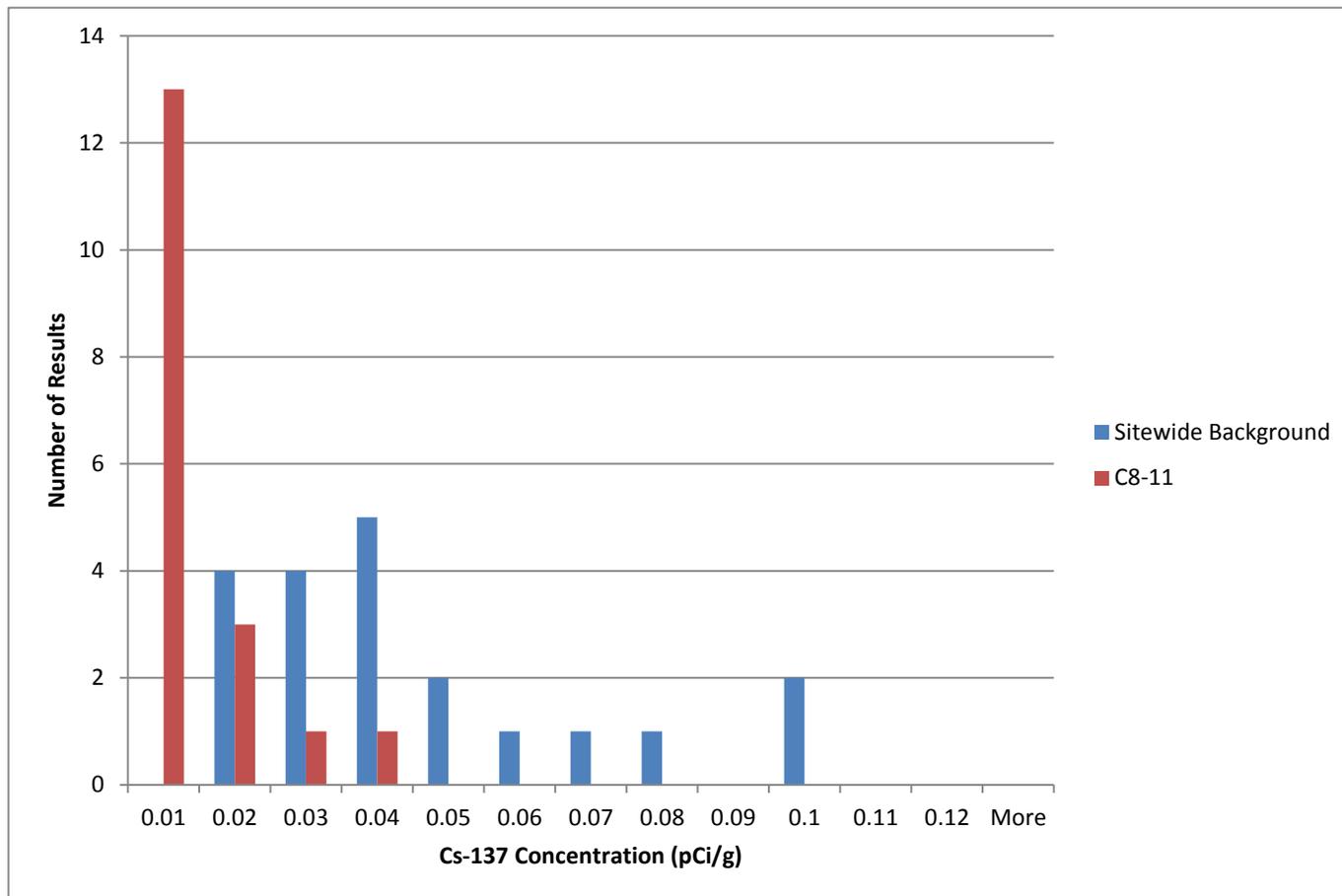
D1-DC	
<i>Bin</i>	<i>Frequency</i>
0.3	3
0.4	1
0.5	4
0.6	9
0.7	1
0.8	0
0.9	0
1	0
1.1	0
1.2	0
1.3	0
1.4	0
More	0



Histogram, RSY D1 (DC) vs. Sitewide Background

Background	
<i>Bin</i>	<i>Frequency</i>
0.01	0
0.02	4
0.03	4
0.04	5
0.05	2
0.06	1
0.07	1
0.08	1
0.09	0
0.1	2
0.11	0
0.12	0
More	0

C8-11	
<i>Bin</i>	<i>Frequency</i>
0.01	13
0.02	3
0.03	1
0.04	1
0.05	0
0.06	0
0.07	0
0.08	0
0.09	0
0.1	0
0.11	0
0.12	0
More	0



TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
Tel: (314)298-8566

TestAmerica Job ID: 160-29896-2

Client Project/Site: Hunters Point Naval Shipyard - Parcel E2

For:

Aptim Federal Services LLC
4005 Port Chicago Hwy, Suite 200
Concord, California 94520

Attn: Eddie Kalombo

Rhonda Ridenhower

Authorized for release by:
8/29/2018 11:44:51 AM

Rhonda Ridenhower, Manager of Project Management
(314)298-8566
rhonda.ridenhower@testamericainc.com

LINKS

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results through
TotalAccess

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Visit us at:
www.testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Case Narrative

Client: Aptim Federal Services LLC
Project/Site: Hunters Point Naval Shipyard - Parcel E2

TestAmerica Job ID: 160-29896-2

Job ID: 160-29896-2

Laboratory: TestAmerica St. Louis**Narrative**

CASE NARRATIVE

Client: Aptim Federal Services LLC**Project: Hunters Point Naval Shipyard - Parcel E2****Report Number: 160-29896-2**

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

TestAmerica St. Louis attests to the validity of the laboratory data generated by TestAmerica facilities reported herein. All analyses performed by TestAmerica facilities were done using established laboratory SOPs that incorporate QA/QC procedures described in the application methods. TestAmerica's operations groups have reviewed the data for compliance with the laboratory QA/QC plan, and data have been found to be compliant with laboratory protocols unless otherwise noted below.

The test results in this report meet all NELAP requirements for parameters for which accreditation is required or available. Any exceptions to NELAP requirements are noted in this report. Pursuant to NELAP, this report may not be reproduced, except in full, without the written approval of the laboratory.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

All solid sample results for Chemistry analyses are reported on an "as received" basis unless otherwise indicated by the presence of a % solids value in the method header. All soil/sediment sample results for radiochemistry analyses are based upon sample as dried and disaggregated with the exception of tritium, carbon-14, and iodine-129 by gamma spectroscopy unless requested as wet weight by the client."

Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative.

Reference the chain of custody and condition upon receipt report for any variations on receipt conditions and temperature of samples on receipt.

Manual Integrations were performed only when necessary and are in compliance with the laboratory's standard operating procedure. Detailed information can be found in the raw data section of the level IV report.

The following clean-up methods for Organic analyses may have been used on the samples in this data set. Specific methods employed are documented on the batch extraction logs:

Method 3600C: Cleanup
Method 3620C: Florisil Cleanup
Method 3630C: Silica Gel Cleanup
Method 3640A: Gel-Permeation Cleanup
Method 3650B: Acid-Base Partition Cleanup
Method 3660B: Sulfur Cleanup

Case Narrative

Client: Aptim Federal Services LLC
Project/Site: Hunters Point Naval Shipyard - Parcel E2

TestAmerica Job ID: 160-29896-2

Job ID: 160-29896-2 (Continued)

Laboratory: TestAmerica St. Louis (Continued)

Method 3665A: Sulfuric Acid/Permanganate Cleanup

This laboratory report is confidential and is intended for the sole use of TestAmerica and its client.

RECEIPT

The samples were received on 08/01/2018; the samples arrived in good condition, properly preserved. The temperatures of the 3 coolers at receipt time were 20.5° C, 20.5° C and 20.5° C.

TOTAL BETA STRONTIUM (GFPC)

Samples PE2-RSYD1-DC-S001 (160-29896-1) and PE2-RSYD1-DC-S011 (160-29896-11) were analyzed for Total Beta Strontium (GFPC) in accordance with EPA 905. The samples were dried on 08/01/2018, prepared on 08/07/2018 and analyzed on 08/23/2018 and 08/28/2018.

The following samples could not be thoroughly homogenized before sub-sampling was performed due to sample matrix: PE2-RSYD1-DC-S001 (160-29896-1), PE2-RSYD1-DC-S011 (160-29896-11) and (160-29896-A-1-A DU). The samples contained detritus material and rocks of varying sizes.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

RADIUM-226 BY GAMMA SPEC (21 DAY INGROWTH)

Samples PE2-RSYD1-DC-S001 (160-29896-1), PE2-RSYD1-DC-S002 (160-29896-2), PE2-RSYD1-DC-S003 (160-29896-3), PE2-RSYD1-DC-S004 (160-29896-4), PE2-RSYD1-DC-S005 (160-29896-5), PE2-RSYD1-DC-S006 (160-29896-6), PE2-RSYD1-DC-S007 (160-29896-7), PE2-RSYD1-DC-S008 (160-29896-8), PE2-RSYD1-DC-S009 (160-29896-9), PE2-RSYD1-DC-S010 (160-29896-10), PE2-RSYD1-DC-S011 (160-29896-11), PE2-RSYD1-DC-S012 (160-29896-12), PE2-RSYD1-DC-S013 (160-29896-13), PE2-RSYD1-DC-S014 (160-29896-14), PE2-RSYD1-DC-S015 (160-29896-15), PE2-RSYD1-DC-S016 (160-29896-16), PE2-RSYD1-DC-S017 (160-29896-17) and PE2-RSYD1-DC-S018 (160-29896-18) were analyzed for Radium-226 by gamma spec (21 day ingrowth) in accordance with EPA GA_01_R. The samples were dried on 08/01/2018, prepared on 08/03/2018 and analyzed on 08/24/2018.

The following sample exhibited a negative result greater in magnitude than the 3 sigma TPU: (160-29896-A-1-E DU). This occurrence was evaluated and determined to be random in nature. Sporadic occurrences such as this are statistically expected. No further action is required.

The cesium-137 detection goal of 0.0700 pCi/g was not met. This is caused by statistical fluctuations in the Compton background due to low level activity in the samples in conjunction with the software attempting to fit a peak into the noise of this baseline. PE2-RSYD1-DC-S009 (160-29896-9) and PE2-RSYD1-DC-S018 (160-29896-18)

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.



APTIM Federal Services, LLC
4005 Port Chicago Hwy
Concord, CA 94520

CHAIN OF CUSTODY

Project Number: 500506

CTO-013 RSYD1 Deconstruction Systematic

Project Name: HPNS - Parcel E-2

Purchase Order #: 202296

Shipment/Pickup Date: 7.31.18

Waybill Number: 126695451396621015

Lab Destination: TestAmerica (St. Louis Lab)

13715 Rider Trail North

Earth City, MO 63045

Lab Contact Name / ph. #: Rhonda Ridenhower (314) 298-8566

Project Manager: Nels Johnson

(Name & phone #)

Send Report To: Eddie Kalombo

Phone/Fax Number: 415-987-0760

Address: 4005 Port Chicago Hwy

City: Concord, CA, 94520

Sampler's Name(s): JOAQUIN RAMIREZ

Sample ID Number	Sample Description	Collection Information		Matrix	# of Containers	Preservative (water)		Total Strontium (EPA 905 MOD)	Strontium 90 (EPA 905 MOD)	Analyses Requested	Dose Rate $\mu\text{R/hr}$
		Date	Time			Method	Container Type				
PE2-RSYD1-DC-S001	Parcel E-2 RSYD1 Deconstruction Systematic	7/24/18	0908	G SO	1	16 oz. plastic jar	X	X			5
PE2-RSYD1-DC-S002	Parcel E-2 RSYD1 Deconstruction Systematic	7/24/18	0917	G SO	1	16 oz. plastic jar	X	X			5
PE2-RSYD1-DC-S003	Parcel E-2 RSYD1 Deconstruction Systematic	7/24/18	0924	G SO	1	16 oz. plastic jar	X	X			5
PE2-RSYD1-DC-S004	Parcel E-2 RSYD1 Deconstruction Systematic	7/24/18	0931	G SO	1	16 oz. plastic jar	X	X			5
PE2-RSYD1-DC-S005	Parcel E-2 RSYD1 Deconstruction Systematic	7/24/18	0938	G SO	1	16 oz. plastic jar	X	X			5
PE2-RSYD1-DC-S006	Parcel E-2 RSYD1 Deconstruction Systematic	7/24/18	0945	G SO	1	16 oz. plastic jar	X	X			5
PE2-RSYD1-DC-S007	Parcel E-2 RSYD1 Deconstruction Systematic	7/24/18	0953	G SO	1	16 oz. plastic jar	X	X			5
PE2-RSYD1-DC-S008	Parcel E-2 RSYD1 Deconstruction Systematic	7/24/18	1001	G SO	1	16 oz. plastic jar	X	X			5
PE2-RSYD1-DC-S009	Parcel E-2 RSYD1 Deconstruction Systematic	7/24/18	1010	G SO	1	16 oz. plastic jar	X	X			5
PE2-RSYD1-DC-S010	Parcel E-2 RSYD1 Deconstruction Systematic	7/24/18	1015	G SO	1	16 oz. plastic jar	X	X			5

Special Instructions:

Analyze for Total Strontium as a screening step, and isotopic Sr-90 only if Total Strontium is above project action limit of 0.331 pCi/g. 7 days ingrown draft and follow with 21 days final.

Level Of QC Required: 24-hr 3-day 10-day

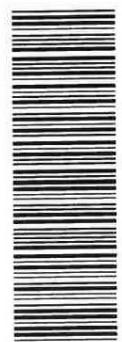
Standard TAT - 10-day

Relinquished By: JOAQUIN RAMIREZ Date: 7.31.18 Time: 1000
 Received By: EDDIE KALOMBO Date: 7.31.18 Time: 1000

Relinquished By: EDDIE KALOMBO Date: 7.31.18 Time: 1600
 Received By: Michael Hellm Date: 8.1.18 Time: 0905

Method Codes: C = Composite G = Grab

Matrix Codes: SO = Soil DW = Drinking Water SL = Sludge WW = Waste Water A = Air
 ABS=Asbestos, PO=Pipe Opening





APTIM Federal Services, LLC
4005 Port Chicago Hwy
Concord, CA 94520

CHAIN OF CUSTODY

Project Number: 500506

CTO-013 RSYD1 Deconstruction
Systematic

Project Name: HPNS - Parcel E-2

Purchase Order #: 202296

Shipment/Pickup Date: 7.31.18

Waybill Number: 126658515 9662 1015

Lab Destination:
TestAmerica (St. Louis Lab)
13715 Rider Trail North
Earth City, MO 63045

Lab Contact Name / ph. #: Rhonda Ridenhower (314) 298-8566

Project Manager: Neils Johnson

(Name & phone #)

Send Report To: Eddie Kalombo

Phone/Fax Number: 415-987-0760

Address: 4005 Port Chicago Hwy

City: Concord, CA, 94520

Sampler's Name(s): JOAQUIN RAMIREZ

Sample ID Number	Sample Description	Collection Information		Matrix	# of containers	Preservative (water)	Preservative (soil)	Container Type	Dose Rate µCi/hr
		Date	Time						
PE2-RSYD1-DC-S011	Parcel E-2 RSYD1 Deconstruction Systematic	7/24/18	1020	SO	1	16 oz. plastic jar			
PE2-RSYD1-DC-S012	Parcel E-2 RSYD1 Deconstruction Systematic	7/24/18	1025	SO	1	16 oz. plastic jar			5
PE2-RSYD1-DC-S013	Parcel E-2 RSYD1 Deconstruction Systematic	7/24/18	1030	SO	1	16 oz. plastic jar			5
PE2-RSYD1-DC-S014	Parcel E-2 RSYD1 Deconstruction Systematic	7/24/18	1036	SO	1	16 oz. plastic jar			5
PE2-RSYD1-DC-S015	Parcel E-2 RSYD1 Deconstruction Systematic	7/24/18	1041	SO	1	16 oz. plastic jar			5
PE2-RSYD1-DC-S016	Parcel E-2 RSYD1 Deconstruction Systematic	7/24/18	1043	SO	1	16 oz. plastic jar			5
PE2-RSYD1-DC-S017	Parcel E-2 RSYD1 Deconstruction Systematic	7/24/18	1046	SO	1	16 oz. plastic jar			5
PE2-RSYD1-DC-S018	Parcel E-2 RSYD1 Deconstruction Systematic	7/24/18	1051	SO	1	16 oz. plastic jar			5

Special Instructions:

Analyze for Total Strontium as a screening step, and isotopic Sr-90 only if Total Strontium is above project action limit of 0.331 pCi/g.
7 days ingrown draft and follow with 21 days final.

Level Of QC Required: 24-hr 3-day 10-day 11

Standard T.A.T -10-day

Reinquisitioned By: JOAQUIN RAMIREZ Date: 7.31.18 Time: 1000
 Received By: EDDIE KALOMBO Date: 7.31.18 Time: 1000

Reinquisitioned By: EDDIE KALOMBO Date: 7.31.18 Time: 1600
 Received By: Michael Bellini Date: 8.1.18 Time: 0905

Method Codes: C = Composite G = Grab
 Matrix Codes: SO = Soil DW = Drinking Water SL = Sludge GW = Ground Water WW = Waste Water A = Air
 ABS=Asbestos, PO=Pipe Opening



Login Sample Receipt Checklist

Client: Aptim Federal Services LLC

Job Number: 160-29896-2

Login Number: 29896**List Source: TestAmerica St. Louis****List Number: 1****Creator: Carter, Kevin M**

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	N/A	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	20.5
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	N/A	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Definitions/Glossary

Client: Aptim Federal Services LLC
 Project/Site: Hunters Point Naval Shipyard - Parcel E2

TestAmerica Job ID: 160-29896-2

Qualifiers

Rad

Qualifier	Qualifier Description
U	Undetected at the Limit of Detection.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Method Summary

Client: Aptim Federal Services LLC
Project/Site: Hunters Point Naval Shipyard - Parcel E2

TestAmerica Job ID: 160-29896-2

Method	Method Description	Protocol	Laboratory
905.0	Total Beta Strontium (GFPC)	DOE	TAL SL
GA-01-R	Radium-226 & Other Gamma Emitters (GS)	DOE	TAL SL
DPS-0	Preparation, Digestion/ Precipitate	None	TAL SL
Dry and Grind	Preparation, Dry and Grind	None	TAL SL
Fill_Geo-21	Fill Geometry, 21-Day In-Growth	None	TAL SL

Protocol References:

DOE = U.S. Department of Energy

None = None

Laboratory References:

TAL SL = TestAmerica St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

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Sample Summary

Client: Aptim Federal Services LLC
 Project/Site: Hunters Point Naval Shipyard - Parcel E2

TestAmerica Job ID: 160-29896-2

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
160-29896-1	PE2-RSYD1-DC-S001	Solid	07/24/18 09:08	08/01/18 09:05
160-29896-2	PE2-RSYD1-DC-S002	Solid	07/24/18 09:17	08/01/18 09:05
160-29896-3	PE2-RSYD1-DC-S003	Solid	07/24/18 09:24	08/01/18 09:05
160-29896-4	PE2-RSYD1-DC-S004	Solid	07/24/18 09:31	08/01/18 09:05
160-29896-5	PE2-RSYD1-DC-S005	Solid	07/24/18 09:38	08/01/18 09:05
160-29896-6	PE2-RSYD1-DC-S006	Solid	07/24/18 09:45	08/01/18 09:05
160-29896-7	PE2-RSYD1-DC-S007	Solid	07/24/18 09:53	08/01/18 09:05
160-29896-8	PE2-RSYD1-DC-S008	Solid	07/24/18 10:01	08/01/18 09:05
160-29896-9	PE2-RSYD1-DC-S009	Solid	07/24/18 10:10	08/01/18 09:05
160-29896-10	PE2-RSYD1-DC-S010	Solid	07/24/18 10:15	08/01/18 09:05
160-29896-11	PE2-RSYD1-DC-S011	Solid	07/24/18 10:20	08/01/18 09:05
160-29896-12	PE2-RSYD1-DC-S012	Solid	07/24/18 10:25	08/01/18 09:05
160-29896-13	PE2-RSYD1-DC-S013	Solid	07/24/18 10:30	08/01/18 09:05
160-29896-14	PE2-RSYD1-DC-S014	Solid	07/24/18 10:36	08/01/18 09:05
160-29896-15	PE2-RSYD1-DC-S015	Solid	07/24/18 10:41	08/01/18 09:05
160-29896-16	PE2-RSYD1-DC-S016	Solid	07/24/18 10:43	08/01/18 09:05
160-29896-17	PE2-RSYD1-DC-S017	Solid	07/24/18 10:46	08/01/18 09:05
160-29896-18	PE2-RSYD1-DC-S018	Solid	07/24/18 10:51	08/01/18 09:05

Client Sample Results

Client: Aptim Federal Services LLC
 Project/Site: Hunters Point Naval Shipyard - Parcel E2

TestAmerica Job ID: 160-29896-2

Client Sample ID: PE2-RSYD1-DC-S001

Lab Sample ID: 160-29896-1

Date Collected: 07/24/18 09:08

Matrix: Solid

Date Received: 08/01/18 09:05

Method: 905.0 - Total Beta Strontium (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
Total Beta Strontium	0.0509	U	0.0735	0.0736	0.331	0.0563	pCi/g	08/07/18 18:44	08/28/18 05:42	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Sr Carrier	76.5		40 - 110					08/07/18 18:44	08/28/18 05:42	1

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
Actinium 228	0.181		0.232	0.232		0.128	pCi/g	08/03/18 12:55	08/24/18 01:21	1
Actinium-227	-0.345	U	0.770	0.771		0.517	pCi/g	08/03/18 12:55	08/24/18 01:21	1
Bismuth-212	-0.694	U	1.27	1.27		0.995	pCi/g	08/03/18 12:55	08/24/18 01:21	1
Bismuth-214	0.594		0.159	0.170		0.0487	pCi/g	08/03/18 12:55	08/24/18 01:21	1
Cesium-137	0.0177	U	0.0844	0.0844	0.0700	0.0677	pCi/g	08/03/18 12:55	08/24/18 01:21	1
Cobalt-60	0.0277	U	0.0550	0.0551	0.200	0.0387	pCi/g	08/03/18 12:55	08/24/18 01:21	1
Lead-210	0.346	U	1.13	1.13		0.811	pCi/g	08/03/18 12:55	08/24/18 01:21	1
Lead-212	0.467		0.102	0.118		0.0441	pCi/g	08/03/18 12:55	08/24/18 01:21	1
Lead-214	0.548		0.124	0.136		0.0597	pCi/g	08/03/18 12:55	08/24/18 01:21	1
Potassium-40	7.21		1.51	1.68		0.344	pCi/g	08/03/18 12:55	08/24/18 01:21	1
Protactinium-231	0.000	U	0.915	0.915		2.42	pCi/g	08/03/18 12:55	08/24/18 01:21	1
Radium-226	0.594		0.159	0.170	0.700	0.0487	pCi/g	08/03/18 12:55	08/24/18 01:21	1
Radium-228	0.181		0.232	0.232		0.128	pCi/g	08/03/18 12:55	08/24/18 01:21	1
Thallium-208	0.226		0.0620	0.0663		0.00992	pCi/g	08/03/18 12:55	08/24/18 01:21	1
Thorium-228	0.467		0.102	0.118		0.0441	pCi/g	08/03/18 12:55	08/24/18 01:21	1
Thorium-232	0.181		0.232	0.232		0.128	pCi/g	08/03/18 12:55	08/24/18 01:21	1
Thorium-234	1.15		0.565	0.578		0.643	pCi/g	08/03/18 12:55	08/24/18 01:21	1
Uranium-235	-0.183	U	0.177	0.178		0.320	pCi/g	08/03/18 12:55	08/24/18 01:21	1
Uranium-238	1.15		0.565	0.578		0.643	pCi/g	08/03/18 12:55	08/24/18 01:21	1

Client Sample ID: PE2-RSYD1-DC-S002

Lab Sample ID: 160-29896-2

Date Collected: 07/24/18 09:17

Matrix: Solid

Date Received: 08/01/18 09:05

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
Actinium 228	0.433		0.212	0.216		0.0839	pCi/g	08/03/18 12:55	08/24/18 01:22	1
Actinium-227	-0.261	U	0.633	0.633		0.405	pCi/g	08/03/18 12:55	08/24/18 01:22	1
Bismuth-212	0.0670	U	0.616	0.616		0.501	pCi/g	08/03/18 12:55	08/24/18 01:22	1
Bismuth-214	0.260		0.111	0.114		0.152	pCi/g	08/03/18 12:55	08/24/18 01:22	1
Cesium-137	0.0209	U	0.0355	0.0356	0.0700	0.0263	pCi/g	08/03/18 12:55	08/24/18 01:22	1
Cobalt-60	0.00513	U	0.00911	0.00912	0.200	0.0371	pCi/g	08/03/18 12:55	08/24/18 01:22	1
Lead-210	0.0286	U	1.20	1.20		0.979	pCi/g	08/03/18 12:55	08/24/18 01:22	1
Lead-212	0.300		0.0789	0.0879		0.0476	pCi/g	08/03/18 12:55	08/24/18 01:22	1
Lead-214	0.505		0.119	0.130		0.0439	pCi/g	08/03/18 12:55	08/24/18 01:22	1
Potassium-40	5.66		1.06	1.21		0.192	pCi/g	08/03/18 12:55	08/24/18 01:22	1

Client Sample Results

Client: Aptim Federal Services LLC
Project/Site: Hunters Point Naval Shipyard - Parcel E2

TestAmerica Job ID: 160-29896-2

Client Sample ID: PE2-RSYD1-DC-S002

Lab Sample ID: 160-29896-2

Date Collected: 07/24/18 09:17

Matrix: Solid

Date Received: 08/01/18 09:05

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS) (Continued)

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	Uncert.						
			(2σ+/-)	(2σ+/-)						
Protactinium-231	0.0000000	U	2.20	2.20		1.81	pCi/g	08/03/18 12:55	08/24/18 01:22	1
	834									
Radium-226	0.260		0.111	0.114	0.700	0.152	pCi/g	08/03/18 12:55	08/24/18 01:22	1
Radium-228	0.433		0.212	0.216		0.0839	pCi/g	08/03/18 12:55	08/24/18 01:22	1
Thallium-208	0.0635		0.0692	0.0695		0.0372	pCi/g	08/03/18 12:55	08/24/18 01:22	1
Thorium-228	0.300		0.0789	0.0879		0.0476	pCi/g	08/03/18 12:55	08/24/18 01:22	1
Thorium-232	0.433		0.212	0.216		0.0839	pCi/g	08/03/18 12:55	08/24/18 01:22	1
Thorium-234	0.00618	U	0.887	0.887		0.728	pCi/g	08/03/18 12:55	08/24/18 01:22	1
Uranium-235	-0.0793	U	0.200	0.200		0.286	pCi/g	08/03/18 12:55	08/24/18 01:22	1
Uranium-238	0.00618	U	0.887	0.887		0.728	pCi/g	08/03/18 12:55	08/24/18 01:22	1

Client Sample ID: PE2-RSYD1-DC-S003

Lab Sample ID: 160-29896-3

Date Collected: 07/24/18 09:24

Matrix: Solid

Date Received: 08/01/18 09:05

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	Uncert.						
			(2σ+/-)	(2σ+/-)						
Actinium 228	0.492		0.144	0.153		0.0465	pCi/g	08/03/18 12:55	08/24/18 01:26	1
Actinium-227	-0.267	U	0.642	0.643		0.413	pCi/g	08/03/18 12:55	08/24/18 01:26	1
Bismuth-212	0.0199	U	0.571	0.571		0.468	pCi/g	08/03/18 12:55	08/24/18 01:26	1
Bismuth-214	0.582		0.107	0.123		0.0302	pCi/g	08/03/18 12:55	08/24/18 01:26	1
Cesium-137	-0.0375	U	0.0582	0.0583	0.0700	0.0452	pCi/g	08/03/18 12:55	08/24/18 01:26	1
Cobalt-60	0.00715	U	0.00405	0.00411	0.200	0.0402	pCi/g	08/03/18 12:55	08/24/18 01:26	1
Lead-210	0.0638	U	1.36	1.36		1.12	pCi/g	08/03/18 12:55	08/24/18 01:26	1
Lead-212	0.360		0.0717	0.0854		0.0342	pCi/g	08/03/18 12:55	08/24/18 01:26	1
Lead-214	0.489		0.133	0.143		0.0537	pCi/g	08/03/18 12:55	08/24/18 01:26	1
Potassium-40	6.97		1.05	1.27		0.227	pCi/g	08/03/18 12:55	08/24/18 01:26	1
Protactinium-231	0.273	U	1.14	1.14		1.78	pCi/g	08/03/18 12:55	08/24/18 01:26	1
Radium-226	0.582		0.107	0.123	0.700	0.0302	pCi/g	08/03/18 12:55	08/24/18 01:26	1
Radium-228	0.492		0.144	0.153		0.0465	pCi/g	08/03/18 12:55	08/24/18 01:26	1
Thallium-208	0.102		0.0569	0.0579		0.0274	pCi/g	08/03/18 12:55	08/24/18 01:26	1
Thorium-228	0.360		0.0717	0.0854		0.0342	pCi/g	08/03/18 12:55	08/24/18 01:26	1
Thorium-232	0.492		0.144	0.153		0.0465	pCi/g	08/03/18 12:55	08/24/18 01:26	1
Thorium-234	0.376	U	1.19	1.19		0.965	pCi/g	08/03/18 12:55	08/24/18 01:26	1
Uranium-235	-0.149	U	0.476	0.476		0.333	pCi/g	08/03/18 12:55	08/24/18 01:26	1
Uranium-238	0.376	U	1.19	1.19		0.965	pCi/g	08/03/18 12:55	08/24/18 01:26	1

Client Sample ID: PE2-RSYD1-DC-S004

Lab Sample ID: 160-29896-4

Date Collected: 07/24/18 09:31

Matrix: Solid

Date Received: 08/01/18 09:05

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	Uncert.						
			(2σ+/-)	(2σ+/-)						
Actinium 228	0.278		0.264	0.266		0.153	pCi/g	08/03/18 12:55	08/24/18 01:27	1

Client Sample Results

Client: Aptim Federal Services LLC
 Project/Site: Hunters Point Naval Shipyard - Parcel E2

TestAmerica Job ID: 160-29896-2

Client Sample ID: PE2-RSYD1-DC-S004

Lab Sample ID: 160-29896-4

Date Collected: 07/24/18 09:31

Matrix: Solid

Date Received: 08/01/18 09:05

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS) (Continued)

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	Uncert.						
			(2σ+/-)	(2σ+/-)						
Actinium-227	0.207	U	0.411	0.412		0.716	pCi/g	08/03/18 12:55	08/24/18 01:27	1
Bismuth-212	-0.590	U	0.644	0.647		0.975	pCi/g	08/03/18 12:55	08/24/18 01:27	1
Bismuth-214	0.523		0.146	0.155		0.0541	pCi/g	08/03/18 12:55	08/24/18 01:27	1
Cesium-137	-0.0275	U	0.0717	0.0718	0.0700	0.0565	pCi/g	08/03/18 12:55	08/24/18 01:27	1
Cobalt-60	0.0149	U	0.0272	0.0272	0.200	0.0449	pCi/g	08/03/18 12:55	08/24/18 01:27	1
Lead-210	0.700	U	1.33	1.33		1.04	pCi/g	08/03/18 12:55	08/24/18 01:27	1
Lead-212	0.465		0.101	0.112		0.0499	pCi/g	08/03/18 12:55	08/24/18 01:27	1
Lead-214	0.647		0.145	0.159		0.0630	pCi/g	08/03/18 12:55	08/24/18 01:27	1
Potassium-40	8.01		1.43	1.64		0.378	pCi/g	08/03/18 12:55	08/24/18 01:27	1
Protactinium-231	0.000	U	0.567	0.567		2.50	pCi/g	08/03/18 12:55	08/24/18 01:27	1
Radium-226	0.523		0.146	0.155	0.700	0.0541	pCi/g	08/03/18 12:55	08/24/18 01:27	1
Radium-228	0.278		0.264	0.266		0.153	pCi/g	08/03/18 12:55	08/24/18 01:27	1
Thallium-208	0.185		0.0697	0.0722		0.0286	pCi/g	08/03/18 12:55	08/24/18 01:27	1
Thorium-228	0.465		0.101	0.112		0.0499	pCi/g	08/03/18 12:55	08/24/18 01:27	1
Thorium-232	0.278		0.264	0.266		0.153	pCi/g	08/03/18 12:55	08/24/18 01:27	1
Thorium-234	-0.0769	U	1.56	1.56		1.28	pCi/g	08/03/18 12:55	08/24/18 01:27	1
Uranium-235	0.0852	U	0.245	0.245		0.509	pCi/g	08/03/18 12:55	08/24/18 01:27	1
Uranium-238	-0.0769	U	1.56	1.56		1.28	pCi/g	08/03/18 12:55	08/24/18 01:27	1

Client Sample ID: PE2-RSYD1-DC-S005

Lab Sample ID: 160-29896-5

Date Collected: 07/24/18 09:38

Matrix: Solid

Date Received: 08/01/18 09:05

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	Uncert.						
			(2σ+/-)	(2σ+/-)						
Actinium 228	0.481		0.168	0.175		0.0676	pCi/g	08/03/18 12:55	08/24/18 02:04	1
Actinium-227	-0.0556	U	0.244	0.244		0.481	pCi/g	08/03/18 12:55	08/24/18 02:04	1
Bismuth-212	0.355	U	0.807	0.808		0.625	pCi/g	08/03/18 12:55	08/24/18 02:04	1
Bismuth-214	0.548		0.134	0.146		0.0312	pCi/g	08/03/18 12:55	08/24/18 02:04	1
Cesium-137	-0.0232	U	0.0529	0.0530	0.0700	0.0653	pCi/g	08/03/18 12:55	08/24/18 02:04	1
Cobalt-60	0.0111	U	0.0723	0.0723	0.200	0.0360	pCi/g	08/03/18 12:55	08/24/18 02:04	1
Lead-210	-0.0768	U	1.43	1.43		1.01	pCi/g	08/03/18 12:55	08/24/18 02:04	1
Lead-212	0.389		0.0928	0.106		0.0438	pCi/g	08/03/18 12:55	08/24/18 02:04	1
Lead-214	0.567		0.119	0.133		0.0633	pCi/g	08/03/18 12:55	08/24/18 02:04	1
Potassium-40	7.44		1.47	1.66		0.320	pCi/g	08/03/18 12:55	08/24/18 02:04	1
Protactinium-231	-0.145	U	2.59	2.59		2.13	pCi/g	08/03/18 12:55	08/24/18 02:04	1
Radium-226	0.548		0.134	0.146	0.700	0.0312	pCi/g	08/03/18 12:55	08/24/18 02:04	1
Radium-228	0.481		0.168	0.175		0.0676	pCi/g	08/03/18 12:55	08/24/18 02:04	1
Thallium-208	0.172		0.0654	0.0678		0.0196	pCi/g	08/03/18 12:55	08/24/18 02:04	1
Thorium-228	0.389		0.0928	0.106		0.0438	pCi/g	08/03/18 12:55	08/24/18 02:04	1
Thorium-232	0.481		0.168	0.175		0.0676	pCi/g	08/03/18 12:55	08/24/18 02:04	1
Thorium-234	0.648		0.486	0.491		0.613	pCi/g	08/03/18 12:55	08/24/18 02:04	1
Uranium-235	0.172	U	0.320	0.321		0.271	pCi/g	08/03/18 12:55	08/24/18 02:04	1
Uranium-238	0.648		0.486	0.491		0.613	pCi/g	08/03/18 12:55	08/24/18 02:04	1

Client Sample Results

Client: Aptim Federal Services LLC
Project/Site: Hunters Point Naval Shipyard - Parcel E2

TestAmerica Job ID: 160-29896-2

Client Sample ID: PE2-RSYD1-DC-S006

Lab Sample ID: 160-29896-6

Date Collected: 07/24/18 09:45

Matrix: Solid

Date Received: 08/01/18 09:05

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	Uncert.						
			(2σ+/-)	(2σ+/-)						
Actinium 228	0.340		0.170	0.174		0.132	pCi/g	08/03/18 12:55	08/24/18 02:04	1
Actinium-227	-0.357	U	0.917	0.918		0.741	pCi/g	08/03/18 12:55	08/24/18 02:04	1
Bismuth-212	-0.372	U	0.973	0.974		0.775	pCi/g	08/03/18 12:55	08/24/18 02:04	1
Bismuth-214	0.667		0.143	0.158		0.0367	pCi/g	08/03/18 12:55	08/24/18 02:04	1
Cesium-137	-0.0196	U	0.0609	0.0610	0.0700	0.0483	pCi/g	08/03/18 12:55	08/24/18 02:04	1
Cobalt-60	0.0341		0.0258	0.0260	0.200	0.0114	pCi/g	08/03/18 12:55	08/24/18 02:04	1
Lead-210	0.813	U	1.31	1.31		0.922	pCi/g	08/03/18 12:55	08/24/18 02:04	1
Lead-212	0.359		0.0879	0.0956		0.0465	pCi/g	08/03/18 12:55	08/24/18 02:04	1
Lead-214	0.469		0.135	0.143		0.0615	pCi/g	08/03/18 12:55	08/24/18 02:04	1
Potassium-40	8.16		1.27	1.51		0.115	pCi/g	08/03/18 12:55	08/24/18 02:04	1
Protactinium-231	-0.168	U	2.88	2.88		2.37	pCi/g	08/03/18 12:55	08/24/18 02:04	1
Radium-226	0.667		0.143	0.158	0.700	0.0367	pCi/g	08/03/18 12:55	08/24/18 02:04	1
Radium-228	0.340		0.170	0.174		0.132	pCi/g	08/03/18 12:55	08/24/18 02:04	1
Thallium-208	0.181		0.0604	0.0632		0.0226	pCi/g	08/03/18 12:55	08/24/18 02:04	1
Thorium-228	0.359		0.0879	0.0956		0.0465	pCi/g	08/03/18 12:55	08/24/18 02:04	1
Thorium-232	0.340		0.170	0.174		0.132	pCi/g	08/03/18 12:55	08/24/18 02:04	1
Thorium-234	-1.38	U	1.00	1.01		1.31	pCi/g	08/03/18 12:55	08/24/18 02:04	1
Uranium-235	0.0724	U	0.284	0.284		0.503	pCi/g	08/03/18 12:55	08/24/18 02:04	1
Uranium-238	-1.38	U	1.00	1.01		1.31	pCi/g	08/03/18 12:55	08/24/18 02:04	1

Client Sample ID: PE2-RSYD1-DC-S007

Lab Sample ID: 160-29896-7

Date Collected: 07/24/18 09:53

Matrix: Solid

Date Received: 08/01/18 09:05

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	Uncert.						
			(2σ+/-)	(2σ+/-)						
Actinium 228	0.422		0.158	0.164		0.0815	pCi/g	08/03/18 12:55	08/24/18 02:06	1
Actinium-227	-0.0418	U	0.0674	0.0675		0.670	pCi/g	08/03/18 12:55	08/24/18 02:06	1
Bismuth-212	-0.0429	U	0.381	0.381		0.702	pCi/g	08/03/18 12:55	08/24/18 02:06	1
Bismuth-214	0.616		0.141	0.155		0.0405	pCi/g	08/03/18 12:55	08/24/18 02:06	1
Cesium-137	0.0166	U	0.0450	0.0450	0.0700	0.0344	pCi/g	08/03/18 12:55	08/24/18 02:06	1
Cobalt-60	-0.0408	U	0.0760	0.0761	0.200	0.0498	pCi/g	08/03/18 12:55	08/24/18 02:06	1
Lead-210	0.732	U	1.10	1.10		0.749	pCi/g	08/03/18 12:55	08/24/18 02:06	1
Lead-212	0.405		0.0961	0.109		0.0479	pCi/g	08/03/18 12:55	08/24/18 02:06	1
Lead-214	0.494		0.135	0.144		0.0529	pCi/g	08/03/18 12:55	08/24/18 02:06	1
Potassium-40	7.85		1.47	1.67		0.295	pCi/g	08/03/18 12:55	08/24/18 02:06	1
Protactinium-231	0.690	U	2.04	2.04		2.24	pCi/g	08/03/18 12:55	08/24/18 02:06	1
Radium-226	0.616		0.141	0.155	0.700	0.0405	pCi/g	08/03/18 12:55	08/24/18 02:06	1
Radium-228	0.422		0.158	0.164		0.0815	pCi/g	08/03/18 12:55	08/24/18 02:06	1
Thallium-208	0.193		0.0902	0.0924		0.0349	pCi/g	08/03/18 12:55	08/24/18 02:06	1
Thorium-228	0.405		0.0961	0.109		0.0479	pCi/g	08/03/18 12:55	08/24/18 02:06	1
Thorium-232	0.422		0.158	0.164		0.0815	pCi/g	08/03/18 12:55	08/24/18 02:06	1
Thorium-234	0.00145	U	1.34	1.34		1.10	pCi/g	08/03/18 12:55	08/24/18 02:06	1
Uranium-235	-0.218	U	0.256	0.257		0.492	pCi/g	08/03/18 12:55	08/24/18 02:06	1
Uranium-238	0.00145	U	1.34	1.34		1.10	pCi/g	08/03/18 12:55	08/24/18 02:06	1

Client Sample Results

Client: Aptim Federal Services LLC
Project/Site: Hunters Point Naval Shipyard - Parcel E2

TestAmerica Job ID: 160-29896-2

Client Sample ID: PE2-RSYD1-DC-S008

Lab Sample ID: 160-29896-8

Date Collected: 07/24/18 10:01

Matrix: Solid

Date Received: 08/01/18 09:05

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	Uncert.						
			(2σ+/-)	(2σ+/-)						
Actinium 228	0.201		0.210	0.211		0.121	pCi/g	08/03/18 12:55	08/24/18 02:37	1
Actinium-227	-0.339	U	0.376	0.378		0.545	pCi/g	08/03/18 12:55	08/24/18 02:37	1
Bismuth-212	-0.458	U	0.852	0.853		0.671	pCi/g	08/03/18 12:55	08/24/18 02:37	1
Bismuth-214	0.499		0.118	0.129		0.0442	pCi/g	08/03/18 12:55	08/24/18 02:37	1
Cesium-137	-0.00719	U	0.0436	0.0436	0.0700	0.0351	pCi/g	08/03/18 12:55	08/24/18 02:37	1
Cobalt-60	0.0109	U	0.0657	0.0657	0.200	0.0319	pCi/g	08/03/18 12:55	08/24/18 02:37	1
Lead-210	0.644		0.790	0.793		0.502	pCi/g	08/03/18 12:55	08/24/18 02:37	1
Lead-212	0.384		0.0737	0.0889		0.0301	pCi/g	08/03/18 12:55	08/24/18 02:37	1
Lead-214	0.577		0.104	0.120		0.0518	pCi/g	08/03/18 12:55	08/24/18 02:37	1
Potassium-40	6.69		1.10	1.29		0.255	pCi/g	08/03/18 12:55	08/24/18 02:37	1
Protactinium-231	0.323	U	1.26	1.26		1.99	pCi/g	08/03/18 12:55	08/24/18 02:37	1
Radium-226	0.499		0.118	0.129	0.700	0.0442	pCi/g	08/03/18 12:55	08/24/18 02:37	1
Radium-228	0.201		0.210	0.211		0.121	pCi/g	08/03/18 12:55	08/24/18 02:37	1
Thallium-208	0.167		0.0552	0.0579		0.0203	pCi/g	08/03/18 12:55	08/24/18 02:37	1
Thorium-228	0.384		0.0737	0.0889		0.0301	pCi/g	08/03/18 12:55	08/24/18 02:37	1
Thorium-232	0.201		0.210	0.211		0.121	pCi/g	08/03/18 12:55	08/24/18 02:37	1
Thorium-234	0.370	U	1.23	1.23		0.996	pCi/g	08/03/18 12:55	08/24/18 02:37	1
Uranium-235	0.144	U	0.336	0.336		0.287	pCi/g	08/03/18 12:55	08/24/18 02:37	1
Uranium-238	0.370	U	1.23	1.23		0.996	pCi/g	08/03/18 12:55	08/24/18 02:37	1

Client Sample ID: PE2-RSYD1-DC-S009

Lab Sample ID: 160-29896-9

Date Collected: 07/24/18 10:10

Matrix: Solid

Date Received: 08/01/18 09:05

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	Uncert.						
			(2σ+/-)	(2σ+/-)						
Actinium 228	0.468		0.170	0.176		0.0775	pCi/g	08/03/18 12:55	08/24/18 02:37	1
Actinium-227	-0.391	U	1.00	1.00		0.811	pCi/g	08/03/18 12:55	08/24/18 02:37	1
Bismuth-212	0.906		0.499	0.508		0.173	pCi/g	08/03/18 12:55	08/24/18 02:37	1
Bismuth-214	0.175		0.209	0.210		0.148	pCi/g	08/03/18 12:55	08/24/18 02:37	1
Cesium-137	-0.0575	U	0.0972	0.0974	0.0700	0.0761	pCi/g	08/03/18 12:55	08/24/18 02:37	1
Cobalt-60	0.0219	U	0.0132	0.0134	0.200	0.0449	pCi/g	08/03/18 12:55	08/24/18 02:37	1
Lead-210	0.260	U	1.57	1.57		1.12	pCi/g	08/03/18 12:55	08/24/18 02:37	1
Lead-212	0.502		0.107	0.119		0.0520	pCi/g	08/03/18 12:55	08/24/18 02:37	1
Lead-214	0.637		0.157	0.170		0.0733	pCi/g	08/03/18 12:55	08/24/18 02:37	1
Potassium-40	8.30		1.38	1.62		0.134	pCi/g	08/03/18 12:55	08/24/18 02:37	1
Protactinium-231	0.0000001	U	3.07	3.07		2.53	pCi/g	08/03/18 12:55	08/24/18 02:37	1
	26									
Radium-226	0.175		0.209	0.210	0.700	0.148	pCi/g	08/03/18 12:55	08/24/18 02:37	1
Radium-228	0.468		0.170	0.176		0.0775	pCi/g	08/03/18 12:55	08/24/18 02:37	1
Thallium-208	0.197		0.0694	0.0722		0.0260	pCi/g	08/03/18 12:55	08/24/18 02:37	1
Thorium-228	0.502		0.107	0.119		0.0520	pCi/g	08/03/18 12:55	08/24/18 02:37	1
Thorium-232	0.468		0.170	0.176		0.0775	pCi/g	08/03/18 12:55	08/24/18 02:37	1
Thorium-234	-1.68	U	1.35	1.36		1.65	pCi/g	08/03/18 12:55	08/24/18 02:37	1
Uranium-235	0.111	U	0.258	0.258		0.442	pCi/g	08/03/18 12:55	08/24/18 02:37	1
Uranium-238	-1.68	U	1.35	1.36		1.65	pCi/g	08/03/18 12:55	08/24/18 02:37	1

Client Sample Results

Client: Aptim Federal Services LLC
 Project/Site: Hunters Point Naval Shipyard - Parcel E2

TestAmerica Job ID: 160-29896-2

Client Sample ID: PE2-RSYD1-DC-S010

Lab Sample ID: 160-29896-10

Date Collected: 07/24/18 10:15

Matrix: Solid

Date Received: 08/01/18 09:05

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	Uncert.						
			(2σ+/-)	(2σ+/-)						
Actinium 228	0.295		0.225	0.227		0.124	pCi/g	08/03/18 12:55	08/24/18 02:38	1
Actinium-227	0.315	U	0.491	0.492		0.658	pCi/g	08/03/18 12:55	08/24/18 02:38	1
Bismuth-212	-0.0179	U	1.00	1.00		0.827	pCi/g	08/03/18 12:55	08/24/18 02:38	1
Bismuth-214	0.544		0.161	0.171		0.0568	pCi/g	08/03/18 12:55	08/24/18 02:38	1
Cesium-137	-0.00303	U	0.0669	0.0669	0.0700	0.0554	pCi/g	08/03/18 12:55	08/24/18 02:38	1
Cobalt-60	0.00660	U	0.0157	0.0157	0.200	0.0535	pCi/g	08/03/18 12:55	08/24/18 02:38	1
Lead-210	1.01	U	1.74	1.74		1.37	pCi/g	08/03/18 12:55	08/24/18 02:38	1
Lead-212	0.426		0.103	0.117		0.0524	pCi/g	08/03/18 12:55	08/24/18 02:38	1
Lead-214	0.648		0.144	0.159		0.0592	pCi/g	08/03/18 12:55	08/24/18 02:38	1
Potassium-40	6.50		1.40	1.55		0.317	pCi/g	08/03/18 12:55	08/24/18 02:38	1
Protactinium-231	0.856	U	2.08	2.08		2.29	pCi/g	08/03/18 12:55	08/24/18 02:38	1
Radium-226	0.544		0.161	0.171	0.700	0.0568	pCi/g	08/03/18 12:55	08/24/18 02:38	1
Radium-228	0.295		0.225	0.227		0.124	pCi/g	08/03/18 12:55	08/24/18 02:38	1
Thallium-208	0.186		0.0665	0.0692		0.0253	pCi/g	08/03/18 12:55	08/24/18 02:38	1
Thorium-228	0.426		0.103	0.117		0.0524	pCi/g	08/03/18 12:55	08/24/18 02:38	1
Thorium-232	0.295		0.225	0.227		0.124	pCi/g	08/03/18 12:55	08/24/18 02:38	1
Thorium-234	0.287	U	0.379	0.380		1.36	pCi/g	08/03/18 12:55	08/24/18 02:38	1
Uranium-235	0.0793	U	0.215	0.215		0.509	pCi/g	08/03/18 12:55	08/24/18 02:38	1
Uranium-238	0.287	U	0.379	0.380		1.36	pCi/g	08/03/18 12:55	08/24/18 02:38	1

Client Sample ID: PE2-RSYD1-DC-S011

Lab Sample ID: 160-29896-11

Date Collected: 07/24/18 10:20

Matrix: Solid

Date Received: 08/01/18 09:05

Method: 905.0 - Total Beta Strontium (GFPC)

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	Uncert.						
			(2σ+/-)	(2σ+/-)						
Total Beta Strontium	0.0170	U	0.0611	0.0612	0.331	0.0486	pCi/g	08/07/18 18:44	08/23/18 05:57	1
Carrier	%Yield	Qualifier	Limits				Prepared	Analyzed	Dil Fac	
Sr Carrier	79.9		40 - 110				08/07/18 18:44	08/23/18 05:57	1	

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	Uncert.						
			(2σ+/-)	(2σ+/-)						
Actinium 228	0.447		0.201	0.206		0.0980	pCi/g	08/03/18 12:55	08/24/18 02:41	1
Actinium-227	-0.00663	U	0.0669	0.0669		0.589	pCi/g	08/03/18 12:55	08/24/18 02:41	1
Bismuth-212	0.0619	U	0.951	0.951		0.777	pCi/g	08/03/18 12:55	08/24/18 02:41	1
Bismuth-214	0.606		0.170	0.181		0.0485	pCi/g	08/03/18 12:55	08/24/18 02:41	1
Cesium-137	-0.0175	U	0.0785	0.0785	0.0700	0.0662	pCi/g	08/03/18 12:55	08/24/18 02:41	1
Cobalt-60	0.0778		0.0492	0.0498	0.200	0.0181	pCi/g	08/03/18 12:55	08/24/18 02:41	1
Lead-210	-0.923	U	1.19	1.20		1.40	pCi/g	08/03/18 12:55	08/24/18 02:41	1
Lead-212	0.588		0.113	0.136		0.0426	pCi/g	08/03/18 12:55	08/24/18 02:41	1
Lead-214	0.712		0.147	0.165		0.0722	pCi/g	08/03/18 12:55	08/24/18 02:41	1
Potassium-40	7.24		1.58	1.74		0.371	pCi/g	08/03/18 12:55	08/24/18 02:41	1
Protactinium-231	0.427	U	1.61	1.61		2.53	pCi/g	08/03/18 12:55	08/24/18 02:41	1

Client Sample Results

Client: Aptim Federal Services LLC
Project/Site: Hunters Point Naval Shipyard - Parcel E2

TestAmerica Job ID: 160-29896-2

Client Sample ID: PE2-RSYD1-DC-S011

Lab Sample ID: 160-29896-11

Date Collected: 07/24/18 10:20

Matrix: Solid

Date Received: 08/01/18 09:05

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS) (Continued)

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	Uncert.						
			(2σ+/-)	(2σ+/-)						
Radium-226	0.606		0.170	0.181	0.700	0.0485	pCi/g	08/03/18 12:55	08/24/18 02:41	1
Radium-228	0.447		0.201	0.206		0.0980	pCi/g	08/03/18 12:55	08/24/18 02:41	1
Thallium-208	0.255		0.0884	0.0923		0.0297	pCi/g	08/03/18 12:55	08/24/18 02:41	1
Thorium-228	0.588		0.113	0.136		0.0426	pCi/g	08/03/18 12:55	08/24/18 02:41	1
Thorium-232	0.447		0.201	0.206		0.0980	pCi/g	08/03/18 12:55	08/24/18 02:41	1
Thorium-234	1.70		1.19	1.20		0.711	pCi/g	08/03/18 12:55	08/24/18 02:41	1
Uranium-235	-0.190	U	0.350	0.351		0.378	pCi/g	08/03/18 12:55	08/24/18 02:41	1
Uranium-238	1.70		1.19	1.20		0.711	pCi/g	08/03/18 12:55	08/24/18 02:41	1

Client Sample ID: PE2-RSYD1-DC-S012

Lab Sample ID: 160-29896-12

Date Collected: 07/24/18 10:25

Matrix: Solid

Date Received: 08/01/18 09:05

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	Uncert.						
			(2σ+/-)	(2σ+/-)						
Actinium 228	0.525		0.147	0.157		0.0359	pCi/g	08/03/18 12:55	08/24/18 02:40	1
Actinium-227	0.324	U	0.482	0.484		0.640	pCi/g	08/03/18 12:55	08/24/18 02:40	1
Bismuth-212	0.390	U	0.760	0.761		0.583	pCi/g	08/03/18 12:55	08/24/18 02:40	1
Bismuth-214	0.579		0.146	0.158		0.0449	pCi/g	08/03/18 12:55	08/24/18 02:40	1
Cesium-137	-0.00653	U	0.0655	0.0655	0.0700	0.0542	pCi/g	08/03/18 12:55	08/24/18 02:40	1
Cobalt-60	-0.0279	U	0.0464	0.0465	0.200	0.0421	pCi/g	08/03/18 12:55	08/24/18 02:40	1
Lead-210	-0.952	U	1.02	1.02		1.61	pCi/g	08/03/18 12:55	08/24/18 02:40	1
Lead-212	0.384		0.0916	0.104		0.0449	pCi/g	08/03/18 12:55	08/24/18 02:40	1
Lead-214	0.588		0.125	0.139		0.0548	pCi/g	08/03/18 12:55	08/24/18 02:40	1
Potassium-40	5.73		1.25	1.38		0.286	pCi/g	08/03/18 12:55	08/24/18 02:40	1
Protactinium-231	-0.135	U	0.385	0.386		2.52	pCi/g	08/03/18 12:55	08/24/18 02:40	1
Radium-226	0.579		0.146	0.158	0.700	0.0449	pCi/g	08/03/18 12:55	08/24/18 02:40	1
Radium-228	0.525		0.147	0.157		0.0359	pCi/g	08/03/18 12:55	08/24/18 02:40	1
Thallium-208	0.192		0.0576	0.0610		0.0174	pCi/g	08/03/18 12:55	08/24/18 02:40	1
Thorium-228	0.384		0.0916	0.104		0.0449	pCi/g	08/03/18 12:55	08/24/18 02:40	1
Thorium-232	0.525		0.147	0.157		0.0359	pCi/g	08/03/18 12:55	08/24/18 02:40	1
Thorium-234	0.0909	U	0.165	0.165		1.36	pCi/g	08/03/18 12:55	08/24/18 02:40	1
Uranium-235	-0.0568	U	0.375	0.375		0.394	pCi/g	08/03/18 12:55	08/24/18 02:40	1
Uranium-238	0.0909	U	0.165	0.165		1.36	pCi/g	08/03/18 12:55	08/24/18 02:40	1

Client Sample ID: PE2-RSYD1-DC-S013

Lab Sample ID: 160-29896-13

Date Collected: 07/24/18 10:30

Matrix: Solid

Date Received: 08/01/18 09:05

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	Uncert.						
			(2σ+/-)	(2σ+/-)						
Actinium 228	0.553		0.186	0.195		0.0427	pCi/g	08/03/18 12:55	08/24/18 07:10	1
Actinium-227	0.102	U	0.441	0.441		0.405	pCi/g	08/03/18 12:55	08/24/18 07:10	1
Bismuth-212	0.575	U	1.34	1.34		1.06	pCi/g	08/03/18 12:55	08/24/18 07:10	1

Client Sample Results

Client: Aptim Federal Services LLC
 Project/Site: Hunters Point Naval Shipyard - Parcel E2

TestAmerica Job ID: 160-29896-2

Client Sample ID: PE2-RSYD1-DC-S013

Lab Sample ID: 160-29896-13

Date Collected: 07/24/18 10:30

Matrix: Solid

Date Received: 08/01/18 09:05

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS) (Continued)

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	Uncert.						
			(2σ+/-)	(2σ+/-)						
Bismuth-214	0.577		0.164	0.175		0.0489	pCi/g	08/03/18 12:55	08/24/18 07:10	1
Cesium-137	-0.0244	U	0.0626	0.0626	0.0700	0.0686	pCi/g	08/03/18 12:55	08/24/18 07:10	1
Cobalt-60	0.0274	U	0.0633	0.0633	0.200	0.0394	pCi/g	08/03/18 12:55	08/24/18 07:10	1
Lead-210	0.777	U	1.40	1.40		0.953	pCi/g	08/03/18 12:55	08/24/18 07:10	1
Lead-212	0.369		0.0968	0.108		0.0479	pCi/g	08/03/18 12:55	08/24/18 07:10	1
Lead-214	0.601		0.150	0.162		0.0519	pCi/g	08/03/18 12:55	08/24/18 07:10	1
Potassium-40	8.88		1.68	1.91		0.349	pCi/g	08/03/18 12:55	08/24/18 07:10	1
Protactinium-231	0.798	U	2.49	2.49		2.01	pCi/g	08/03/18 12:55	08/24/18 07:10	1
Radium-226	0.577		0.164	0.175	0.700	0.0489	pCi/g	08/03/18 12:55	08/24/18 07:10	1
Radium-228	0.553		0.186	0.195		0.0427	pCi/g	08/03/18 12:55	08/24/18 07:10	1
Thallium-208	0.165		0.0610	0.0633		0.0159	pCi/g	08/03/18 12:55	08/24/18 07:10	1
Thorium-228	0.369		0.0968	0.108		0.0479	pCi/g	08/03/18 12:55	08/24/18 07:10	1
Thorium-232	0.553		0.186	0.195		0.0427	pCi/g	08/03/18 12:55	08/24/18 07:10	1
Thorium-234	1.12		1.30	1.30		1.01	pCi/g	08/03/18 12:55	08/24/18 07:10	1
Uranium-235	0.263		0.283	0.285		0.216	pCi/g	08/03/18 12:55	08/24/18 07:10	1
Uranium-238	1.12		1.30	1.30		1.01	pCi/g	08/03/18 12:55	08/24/18 07:10	1

Client Sample ID: PE2-RSYD1-DC-S014

Lab Sample ID: 160-29896-14

Date Collected: 07/24/18 10:36

Matrix: Solid

Date Received: 08/01/18 09:05

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	Uncert.						
			(2σ+/-)	(2σ+/-)						
Actinium 228	0.448		0.192	0.198		0.0734	pCi/g	08/03/18 12:55	08/24/18 07:23	1
Actinium-227	-0.176	U	0.680	0.680		0.552	pCi/g	08/03/18 12:55	08/24/18 07:23	1
Bismuth-212	0.310	U	0.535	0.536		0.409	pCi/g	08/03/18 12:55	08/24/18 07:23	1
Bismuth-214	0.417		0.0992	0.108		0.0373	pCi/g	08/03/18 12:55	08/24/18 07:23	1
Cesium-137	0.00993	U	0.0369	0.0369	0.0700	0.0292	pCi/g	08/03/18 12:55	08/24/18 07:23	1
Cobalt-60	-0.0273	U	0.0782	0.0783	0.200	0.0375	pCi/g	08/03/18 12:55	08/24/18 07:23	1
Lead-210	0.605	U	1.44	1.44		1.16	pCi/g	08/03/18 12:55	08/24/18 07:23	1
Lead-212	0.377		0.0755	0.0899		0.0355	pCi/g	08/03/18 12:55	08/24/18 07:23	1
Lead-214	0.577		0.0987	0.115		0.0469	pCi/g	08/03/18 12:55	08/24/18 07:23	1
Potassium-40	7.83		1.15	1.40		0.245	pCi/g	08/03/18 12:55	08/24/18 07:23	1
Protactinium-231	-0.794	U	2.64	2.64		2.15	pCi/g	08/03/18 12:55	08/24/18 07:23	1
Radium-226	0.417		0.0992	0.108	0.700	0.0373	pCi/g	08/03/18 12:55	08/24/18 07:23	1
Radium-228	0.448		0.192	0.198		0.0734	pCi/g	08/03/18 12:55	08/24/18 07:23	1
Thallium-208	0.160		0.0468	0.0497		0.0156	pCi/g	08/03/18 12:55	08/24/18 07:23	1
Thorium-228	0.377		0.0755	0.0899		0.0355	pCi/g	08/03/18 12:55	08/24/18 07:23	1
Thorium-232	0.448		0.192	0.198		0.0734	pCi/g	08/03/18 12:55	08/24/18 07:23	1
Thorium-234	0.520	U	1.18	1.18		0.952	pCi/g	08/03/18 12:55	08/24/18 07:23	1
Uranium-235	0.0349	U	0.212	0.212		0.327	pCi/g	08/03/18 12:55	08/24/18 07:23	1
Uranium-238	0.520	U	1.18	1.18		0.952	pCi/g	08/03/18 12:55	08/24/18 07:23	1

Client Sample Results

Client: Aptim Federal Services LLC
Project/Site: Hunters Point Naval Shipyard - Parcel E2

TestAmerica Job ID: 160-29896-2

Client Sample ID: PE2-RSYD1-DC-S015

Lab Sample ID: 160-29896-15

Date Collected: 07/24/18 10:41

Matrix: Solid

Date Received: 08/01/18 09:05

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	Uncert.						
			(2σ+/-)	(2σ+/-)						
Actinium 228	0.556		0.206	0.214		0.0722	pCi/g	08/03/18 12:55	08/24/18 07:23	1
Actinium-227	-0.385	U	1.02	1.03		0.828	pCi/g	08/03/18 12:55	08/24/18 07:23	1
Bismuth-212	0.0165	U	0.888	0.888		0.730	pCi/g	08/03/18 12:55	08/24/18 07:23	1
Bismuth-214	0.620		0.175	0.186		0.0607	pCi/g	08/03/18 12:55	08/24/18 07:23	1
Cesium-137	-0.0266	U	0.0683	0.0684	0.0700	0.0536	pCi/g	08/03/18 12:55	08/24/18 07:23	1
Cobalt-60	-0.00436	U	0.00855	0.00856	0.200	0.0458	pCi/g	08/03/18 12:55	08/24/18 07:23	1
Lead-210	1.20		1.75	1.76		1.15	pCi/g	08/03/18 12:55	08/24/18 07:23	1
Lead-212	0.421		0.110	0.118		0.0620	pCi/g	08/03/18 12:55	08/24/18 07:23	1
Lead-214	0.586		0.131	0.144		0.0738	pCi/g	08/03/18 12:55	08/24/18 07:23	1
Potassium-40	7.59		1.34	1.54		0.137	pCi/g	08/03/18 12:55	08/24/18 07:23	1
Protactinium-231	0.299	U	1.72	1.72		2.66	pCi/g	08/03/18 12:55	08/24/18 07:23	1
Radium-226	0.620		0.175	0.186	0.700	0.0607	pCi/g	08/03/18 12:55	08/24/18 07:23	1
Radium-228	0.556		0.206	0.214		0.0722	pCi/g	08/03/18 12:55	08/24/18 07:23	1
Thallium-208	0.153		0.0610	0.0629		0.0253	pCi/g	08/03/18 12:55	08/24/18 07:23	1
Thorium-228	0.421		0.110	0.118		0.0620	pCi/g	08/03/18 12:55	08/24/18 07:23	1
Thorium-232	0.556		0.206	0.214		0.0722	pCi/g	08/03/18 12:55	08/24/18 07:23	1
Thorium-234	-1.45	U	1.31	1.32		1.42	pCi/g	08/03/18 12:55	08/24/18 07:23	1
Uranium-235	0.117	U	0.247	0.247		0.568	pCi/g	08/03/18 12:55	08/24/18 07:23	1
Uranium-238	-1.45	U	1.31	1.32		1.42	pCi/g	08/03/18 12:55	08/24/18 07:23	1

Client Sample ID: PE2-RSYD1-DC-S016

Lab Sample ID: 160-29896-16

Date Collected: 07/24/18 10:43

Matrix: Solid

Date Received: 08/01/18 09:05

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	Uncert.						
			(2σ+/-)	(2σ+/-)						
Actinium 228	0.429		0.168	0.174		0.0385	pCi/g	08/03/18 12:55	08/24/18 07:24	1
Actinium-227	0.354		0.371	0.373		0.265	pCi/g	08/03/18 12:55	08/24/18 07:24	1
Bismuth-212	-0.0453	U	0.983	0.983		0.700	pCi/g	08/03/18 12:55	08/24/18 07:24	1
Bismuth-214	0.626		0.165	0.177		0.0610	pCi/g	08/03/18 12:55	08/24/18 07:24	1
Cesium-137	0.0356	U	0.0767	0.0767	0.0700	0.0597	pCi/g	08/03/18 12:55	08/24/18 07:24	1
Cobalt-60	0.0126	U	0.0744	0.0744	0.200	0.0385	pCi/g	08/03/18 12:55	08/24/18 07:24	1
Lead-210	1.30		1.10	1.12		0.797	pCi/g	08/03/18 12:55	08/24/18 07:24	1
Lead-212	0.329		0.0993	0.108		0.0572	pCi/g	08/03/18 12:55	08/24/18 07:24	1
Lead-214	0.649		0.144	0.159		0.0678	pCi/g	08/03/18 12:55	08/24/18 07:24	1
Potassium-40	6.25		1.36	1.50		0.311	pCi/g	08/03/18 12:55	08/24/18 07:24	1
Protactinium-231	0.000	U	0.507	0.507		2.59	pCi/g	08/03/18 12:55	08/24/18 07:24	1
Radium-226	0.626		0.165	0.177	0.700	0.0610	pCi/g	08/03/18 12:55	08/24/18 07:24	1
Radium-228	0.429		0.168	0.174		0.0385	pCi/g	08/03/18 12:55	08/24/18 07:24	1
Thallium-208	0.152		0.0595	0.0616		0.0238	pCi/g	08/03/18 12:55	08/24/18 07:24	1
Thorium-228	0.329		0.0993	0.108		0.0572	pCi/g	08/03/18 12:55	08/24/18 07:24	1
Thorium-232	0.429		0.168	0.174		0.0385	pCi/g	08/03/18 12:55	08/24/18 07:24	1
Thorium-234	0.0269	U	1.51	1.51		1.24	pCi/g	08/03/18 12:55	08/24/18 07:24	1
Uranium-235	0.140	U	0.293	0.294		0.552	pCi/g	08/03/18 12:55	08/24/18 07:24	1
Uranium-238	0.0269	U	1.51	1.51		1.24	pCi/g	08/03/18 12:55	08/24/18 07:24	1

Client Sample Results

Client: Aptim Federal Services LLC
Project/Site: Hunters Point Naval Shipyard - Parcel E2

TestAmerica Job ID: 160-29896-2

Client Sample ID: PE2-RSYD1-DC-S017

Lab Sample ID: 160-29896-17

Date Collected: 07/24/18 10:46

Matrix: Solid

Date Received: 08/01/18 09:05

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	Uncert.						
			(2σ+/-)	(2σ+/-)						
Actinium 228	0.519		0.175	0.183		0.0345	pCi/g	08/03/18 12:55	08/24/18 07:22	1
Actinium-227	0.189	U	0.558	0.558		0.728	pCi/g	08/03/18 12:55	08/24/18 07:22	1
Bismuth-212	0.333	U	0.811	0.811		0.634	pCi/g	08/03/18 12:55	08/24/18 07:22	1
Bismuth-214	0.562		0.146	0.157		0.0527	pCi/g	08/03/18 12:55	08/24/18 07:22	1
Cesium-137	0.0113	U	0.0612	0.0612	0.0700	0.0492	pCi/g	08/03/18 12:55	08/24/18 07:22	1
Cobalt-60	0.0303	U	0.0248	0.0249	0.200	0.0324	pCi/g	08/03/18 12:55	08/24/18 07:22	1
Lead-210	0.820	U	1.73	1.73		1.14	pCi/g	08/03/18 12:55	08/24/18 07:22	1
Lead-212	0.421		0.0938	0.104		0.0432	pCi/g	08/03/18 12:55	08/24/18 07:22	1
Lead-214	0.546		0.160	0.169		0.0727	pCi/g	08/03/18 12:55	08/24/18 07:22	1
Potassium-40	6.65		1.33	1.49		0.382	pCi/g	08/03/18 12:55	08/24/18 07:22	1
Protactinium-231	-0.000000	U	3.07	3.07		2.53	pCi/g	08/03/18 12:55	08/24/18 07:22	1
	611									
Radium-226	0.562		0.146	0.157	0.700	0.0527	pCi/g	08/03/18 12:55	08/24/18 07:22	1
Radium-228	0.519		0.175	0.183		0.0345	pCi/g	08/03/18 12:55	08/24/18 07:22	1
Thallium-208	0.131		0.0969	0.0979		0.0470	pCi/g	08/03/18 12:55	08/24/18 07:22	1
Thorium-228	0.421		0.0938	0.104		0.0432	pCi/g	08/03/18 12:55	08/24/18 07:22	1
Thorium-232	0.519		0.175	0.183		0.0345	pCi/g	08/03/18 12:55	08/24/18 07:22	1
Thorium-234	-0.0887	U	1.52	1.52		1.25	pCi/g	08/03/18 12:55	08/24/18 07:22	1
Uranium-235	0.0978	U	0.277	0.277		0.595	pCi/g	08/03/18 12:55	08/24/18 07:22	1
Uranium-238	-0.0887	U	1.52	1.52		1.25	pCi/g	08/03/18 12:55	08/24/18 07:22	1

Client Sample ID: PE2-RSYD1-DC-S018

Lab Sample ID: 160-29896-18

Date Collected: 07/24/18 10:51

Matrix: Solid

Date Received: 08/01/18 09:05

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	Uncert.						
			(2σ+/-)	(2σ+/-)						
Actinium 228	0.172		0.301	0.301		0.147	pCi/g	08/03/18 12:55	08/24/18 07:23	1
Actinium-227	0.102	U	0.274	0.274		0.755	pCi/g	08/03/18 12:55	08/24/18 07:23	1
Bismuth-212	0.356	U	0.658	0.659		0.491	pCi/g	08/03/18 12:55	08/24/18 07:23	1
Bismuth-214	0.247		0.139	0.142		0.109	pCi/g	08/03/18 12:55	08/24/18 07:23	1
Cesium-137	0.0258	U	0.0947	0.0948	0.0700	0.0757	pCi/g	08/03/18 12:55	08/24/18 07:23	1
Cobalt-60	-0.0238	U	0.0806	0.0807	0.200	0.0461	pCi/g	08/03/18 12:55	08/24/18 07:23	1
Lead-210	-0.991	U	1.60	1.61		1.68	pCi/g	08/03/18 12:55	08/24/18 07:23	1
Lead-212	0.538		0.111	0.131		0.0527	pCi/g	08/03/18 12:55	08/24/18 07:23	1
Lead-214	0.603		0.146	0.159		0.0749	pCi/g	08/03/18 12:55	08/24/18 07:23	1
Potassium-40	8.15		1.99	2.16		0.715	pCi/g	08/03/18 12:55	08/24/18 07:23	1
Protactinium-231	0.767	U	2.42	2.43		1.96	pCi/g	08/03/18 12:55	08/24/18 07:23	1
Radium-226	0.247		0.139	0.142	0.700	0.109	pCi/g	08/03/18 12:55	08/24/18 07:23	1
Radium-228	0.172		0.301	0.301		0.147	pCi/g	08/03/18 12:55	08/24/18 07:23	1
Thallium-208	0.174		0.0737	0.0758		0.0316	pCi/g	08/03/18 12:55	08/24/18 07:23	1
Thorium-228	0.538		0.111	0.131		0.0527	pCi/g	08/03/18 12:55	08/24/18 07:23	1
Thorium-232	0.172		0.301	0.301		0.147	pCi/g	08/03/18 12:55	08/24/18 07:23	1
Thorium-234	-0.397	U	1.63	1.63		1.35	pCi/g	08/03/18 12:55	08/24/18 07:23	1
Uranium-235	0.0243	U	0.0738	0.0739		0.424	pCi/g	08/03/18 12:55	08/24/18 07:23	1
Uranium-238	-0.397	U	1.63	1.63		1.35	pCi/g	08/03/18 12:55	08/24/18 07:23	1

QC Sample Results

Client: Aptim Federal Services LLC
 Project/Site: Hunters Point Naval Shipyard - Parcel E2

TestAmerica Job ID: 160-29896-2

Method: 905.0 - Total Beta Strontium (GFPC)

Lab Sample ID: MB 160-380968/22-A
Matrix: Solid
Analysis Batch: 384724

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 380968

Analyte	MB MB		Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
	Result	Qualifier	Uncert. (2σ+/-)	Uncert. (2σ+/-)						
Total Beta Strontium	-0.02050	U	0.0574	0.0574	0.331	0.0492	pCi/g	08/07/18 18:44	08/23/18 06:02	1
Carrier	MB MB		Limits		Prepared	Analyzed	Dil Fac			
Sr Carrier	%Yield	Qualifier	Limits							
Sr Carrier	81.9		40 - 110		08/07/18 18:44	08/23/18 06:02	1			

Lab Sample ID: LCS 160-380968/1-A
Matrix: Solid
Analysis Batch: 384726

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 380968

Analyte	Spike Added	LCS Result	LCS Qual	Total	LOQ	DLC	Unit	%Rec	%Rec. Limits
				Uncert. (2σ+/-)					
Total Beta Strontium	8.20	7.829		0.640	0.331	0.0503	pCi/g	95	75 - 125
Carrier	LCS LCS		Limits		Prepared	Analyzed	Dil Fac		
Sr Carrier	%Yield	Qualifier	Limits						
Sr Carrier	83.0		40 - 110		08/07/18 18:44	08/23/18 06:02	1		

Lab Sample ID: 160-29896-1 DU
Matrix: Solid
Analysis Batch: 385698

Client Sample ID: PE2-RSYD1-DC-S001
Prep Type: Total/NA
Prep Batch: 380968

Analyte	Sample Sample		DU	DU	Total	LOQ	DLC	Unit	RER	RER Limit
	Result	Qual	Result	Qual	Uncert. (2σ+/-)					
Total Beta Strontium	0.0509	U	0.09816		0.0756	0.331	0.0541	pCi/g	0.32	1
Carrier	DU DU		Limits		Prepared	Analyzed	Dil Fac			
Sr Carrier	%Yield	Qualifier	Limits							
Sr Carrier	79.5		40 - 110		08/07/18 18:44	08/23/18 06:02	1			

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Lab Sample ID: MB 160-380170/1-A
Matrix: Solid
Analysis Batch: 385096

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 380170

Analyte	MB MB		Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
	Result	Qualifier	Uncert. (2σ+/-)	Uncert. (2σ+/-)						
Actinium 228	0.09797		0.165	0.165		0.0883	pCi/g	08/03/18 12:55	08/24/18 01:16	1
Actinium-227	0.004713	U	0.0931	0.0931		0.303	pCi/g	08/03/18 12:55	08/24/18 01:16	1
Bismuth-212	-0.05593	U	0.428	0.428		0.523	pCi/g	08/03/18 12:55	08/24/18 01:16	1
Bismuth-214	-0.05117	U	0.117	0.117		0.179	pCi/g	08/03/18 12:55	08/24/18 01:16	1
Cesium-137	0.02977	U	0.0624	0.0625	0.0700	0.0476	pCi/g	08/03/18 12:55	08/24/18 01:16	1
Cobalt-60	0.0000	U	0.0139	0.0139	0.200	0.0162	pCi/g	08/03/18 12:55	08/24/18 01:16	1
Lead-210	0.2962	U	0.805	0.806		0.607	pCi/g	08/03/18 12:55	08/24/18 01:16	1
Lead-212	-0.02426	U	0.0893	0.0894		0.0751	pCi/g	08/03/18 12:55	08/24/18 01:16	1
Lead-214	-0.08216	U	0.156	0.156		0.0932	pCi/g	08/03/18 12:55	08/24/18 01:16	1

QC Sample Results

Client: Aptim Federal Services LLC
Project/Site: Hunters Point Naval Shipyard - Parcel E2

TestAmerica Job ID: 160-29896-2

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS) (Continued)

Lab Sample ID: MB 160-380170/1-A
Matrix: Solid
Analysis Batch: 385096

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 380170

Analyte	MB MB		Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
	Result	Qualifier	Uncert. (2σ+/-)	Uncert. (2σ+/-)						
Potassium-40	0.2998	U	0.490	0.491		0.316	pCi/g	08/03/18 12:55	08/24/18 01:16	1
Protactinium-231	0.0000	U	0.550	0.550		1.54	pCi/g	08/03/18 12:55	08/24/18 01:16	1
Radium-226	-0.05117	U	0.117	0.117	0.700	0.179	pCi/g	08/03/18 12:55	08/24/18 01:16	1
Radium-228	0.09797		0.165	0.165		0.0883	pCi/g	08/03/18 12:55	08/24/18 01:16	1
Thallium-208	0.03459	U	0.0261	0.0264		0.0348	pCi/g	08/03/18 12:55	08/24/18 01:16	1
Thorium-228	-0.02426	U	0.0893	0.0894		0.0751	pCi/g	08/03/18 12:55	08/24/18 01:16	1
Thorium-232	0.09797		0.165	0.165		0.0883	pCi/g	08/03/18 12:55	08/24/18 01:16	1
Thorium-234	-0.6967	U	0.870	0.874		0.725	pCi/g	08/03/18 12:55	08/24/18 01:16	1
Uranium-235	0.09374	U	0.269	0.269		0.215	pCi/g	08/03/18 12:55	08/24/18 01:16	1
Uranium-238	-0.6967	U	0.870	0.874		0.725	pCi/g	08/03/18 12:55	08/24/18 01:16	1

Lab Sample ID: LCS 160-380170/2-A
Matrix: Solid
Analysis Batch: 385097

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 380170

Analyte	Spike Added	LCS Result	LCS Qual	Total	LOQ	DLC	Unit	%Rec	%Rec.
				Uncert. (2σ+/-)					Limits
Americium-241	96.8	95.91		10.1		0.602	pCi/g	99	87 - 116
Cesium-137	28.2	26.89		2.89	0.0700	0.115	pCi/g	95	87 - 120
Cobalt-60	12.8	12.44		1.32	0.200	0.0586	pCi/g	97	87 - 115

Lab Sample ID: 160-29896-1 DU
Matrix: Solid
Analysis Batch: 385099

Client Sample ID: PE2-RSYD1-DC-S001
Prep Type: Total/NA
Prep Batch: 380170

Analyte	Sample Sample		DU DU		Total	LOQ	DLC	Unit	RER	RER
	Result	Qual	Result	Qual	Uncert. (2σ+/-)					Limit
Actinium 228	0.181		0.5370		0.143		0.0225	pCi/g	0.95	1
Actinium-227	-0.345	U	-0.2618	U	0.163		0.545	pCi/g	0.09	1
Bismuth-212	-0.694	U	-0.2339	U	0.668		0.532	pCi/g	0.24	1
Bismuth-214	0.594		0.5510		0.130		0.0388	pCi/g	0.14	1
Cesium-137	0.0177	U	-0.03917	U	0.0640	0.0700	0.0500	pCi/g	0.38	1
Cobalt-60	0.0277	U	0.02692		0.0469	0.200	0.0210	pCi/g	0.01	1
Lead-210	0.346	U	-0.2717	U	0.675		0.994	pCi/g	0.34	1
Lead-212	0.467		0.4405		0.0954		0.0318	pCi/g	0.12	1
Lead-214	0.548		0.5766		0.113		0.0461	pCi/g	0.11	1
Potassium-40	7.21		6.940		1.28		0.237	pCi/g	0.09	1
Protactinium-231	0.000	U	-0.7696	U	2.55		2.08	pCi/g	0.22	1
Radium-226	0.594		0.5510		0.130	0.700	0.0388	pCi/g	0.14	1
Radium-228	0.181		0.5370		0.143		0.0225	pCi/g	0.95	1
Thallium-208	0.226		0.1550		0.0461		0.0139	pCi/g	0.63	1
Thorium-228	0.467		0.4405		0.0954		0.0318	pCi/g	0.12	1
Thorium-232	0.181		0.5370		0.143		0.0225	pCi/g	0.95	1
Thorium-234	1.15		-0.2969	U	1.22		0.991	pCi/g	0.81	1
Uranium-235	-0.183	U	-0.1653	U	0.0732		0.372	pCi/g	0.07	1
Uranium-238	1.15		-0.2969	U	1.22		0.991	pCi/g	0.81	1

QC Association Summary

Client: Aptim Federal Services LLC
 Project/Site: Hunters Point Naval Shipyard - Parcel E2

TestAmerica Job ID: 160-29896-2

Rad

Leach Batch: 379757

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-29896-1	PE2-RSYD1-DC-S001	Total/NA	Solid	Dry and Grind	
160-29896-2	PE2-RSYD1-DC-S002	Total/NA	Solid	Dry and Grind	
160-29896-3	PE2-RSYD1-DC-S003	Total/NA	Solid	Dry and Grind	
160-29896-4	PE2-RSYD1-DC-S004	Total/NA	Solid	Dry and Grind	
160-29896-5	PE2-RSYD1-DC-S005	Total/NA	Solid	Dry and Grind	
160-29896-6	PE2-RSYD1-DC-S006	Total/NA	Solid	Dry and Grind	
160-29896-7	PE2-RSYD1-DC-S007	Total/NA	Solid	Dry and Grind	
160-29896-8	PE2-RSYD1-DC-S008	Total/NA	Solid	Dry and Grind	
160-29896-9	PE2-RSYD1-DC-S009	Total/NA	Solid	Dry and Grind	
160-29896-10	PE2-RSYD1-DC-S010	Total/NA	Solid	Dry and Grind	
160-29896-11	PE2-RSYD1-DC-S011	Total/NA	Solid	Dry and Grind	
160-29896-12	PE2-RSYD1-DC-S012	Total/NA	Solid	Dry and Grind	
160-29896-13	PE2-RSYD1-DC-S013	Total/NA	Solid	Dry and Grind	
160-29896-14	PE2-RSYD1-DC-S014	Total/NA	Solid	Dry and Grind	
160-29896-15	PE2-RSYD1-DC-S015	Total/NA	Solid	Dry and Grind	
160-29896-16	PE2-RSYD1-DC-S016	Total/NA	Solid	Dry and Grind	
160-29896-17	PE2-RSYD1-DC-S017	Total/NA	Solid	Dry and Grind	
160-29896-18	PE2-RSYD1-DC-S018	Total/NA	Solid	Dry and Grind	
160-29896-1 DU	PE2-RSYD1-DC-S001	Total/NA	Solid	Dry and Grind	

Prep Batch: 380170

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-29896-1	PE2-RSYD1-DC-S001	Total/NA	Solid	Fill_Geo-21	379757
160-29896-2	PE2-RSYD1-DC-S002	Total/NA	Solid	Fill_Geo-21	379757
160-29896-3	PE2-RSYD1-DC-S003	Total/NA	Solid	Fill_Geo-21	379757
160-29896-4	PE2-RSYD1-DC-S004	Total/NA	Solid	Fill_Geo-21	379757
160-29896-5	PE2-RSYD1-DC-S005	Total/NA	Solid	Fill_Geo-21	379757
160-29896-6	PE2-RSYD1-DC-S006	Total/NA	Solid	Fill_Geo-21	379757
160-29896-7	PE2-RSYD1-DC-S007	Total/NA	Solid	Fill_Geo-21	379757
160-29896-8	PE2-RSYD1-DC-S008	Total/NA	Solid	Fill_Geo-21	379757
160-29896-9	PE2-RSYD1-DC-S009	Total/NA	Solid	Fill_Geo-21	379757
160-29896-10	PE2-RSYD1-DC-S010	Total/NA	Solid	Fill_Geo-21	379757
160-29896-11	PE2-RSYD1-DC-S011	Total/NA	Solid	Fill_Geo-21	379757
160-29896-12	PE2-RSYD1-DC-S012	Total/NA	Solid	Fill_Geo-21	379757
160-29896-13	PE2-RSYD1-DC-S013	Total/NA	Solid	Fill_Geo-21	379757
160-29896-14	PE2-RSYD1-DC-S014	Total/NA	Solid	Fill_Geo-21	379757
160-29896-15	PE2-RSYD1-DC-S015	Total/NA	Solid	Fill_Geo-21	379757
160-29896-16	PE2-RSYD1-DC-S016	Total/NA	Solid	Fill_Geo-21	379757
160-29896-17	PE2-RSYD1-DC-S017	Total/NA	Solid	Fill_Geo-21	379757
160-29896-18	PE2-RSYD1-DC-S018	Total/NA	Solid	Fill_Geo-21	379757
MB 160-380170/1-A	Method Blank	Total/NA	Solid	Fill_Geo-21	
LCS 160-380170/2-A	Lab Control Sample	Total/NA	Solid	Fill_Geo-21	
160-29896-1 DU	PE2-RSYD1-DC-S001	Total/NA	Solid	Fill_Geo-21	379757

Prep Batch: 380968

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-29896-1	PE2-RSYD1-DC-S001	Total/NA	Solid	DPS-0	379757
160-29896-11	PE2-RSYD1-DC-S011	Total/NA	Solid	DPS-0	379757
MB 160-380968/22-A	Method Blank	Total/NA	Solid	DPS-0	
LCS 160-380968/1-A	Lab Control Sample	Total/NA	Solid	DPS-0	
160-29896-1 DU	PE2-RSYD1-DC-S001	Total/NA	Solid	DPS-0	379757

Tracer/Carrier Summary

Client: Aptim Federal Services LLC
 Project/Site: Hunters Point Naval Shipyard - Parcel E2

TestAmerica Job ID: 160-29896-2

Method: 905.0 - Total Beta Strontium (GFPC)

Matrix: Solid

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Sr Carrier (40-110)	Percent Yield (Acceptance Limits)
160-29896-1	PE2-RSYD1-DC-S001	76.5	
160-29896-1 DU	PE2-RSYD1-DC-S001	79.5	
160-29896-11	PE2-RSYD1-DC-S011	79.9	
LCS 160-380968/1-A	Lab Control Sample	83.0	
MB 160-380968/22-A	Method Blank	81.9	

Tracer/Carrier Legend

Sr Carrier = Sr Carrier

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